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Preface

THERE IS A GREAT temptation to write at length about the many issues that led to this study. The temptation has been put aside and only a few major happenings and issues involved in the decision to make such a study will be mentioned briefly.

The senior author, as a staff member of the Rockefeller Foundation, had been concerned with recommending grants in the fields of medical education and medical care. The experiences gained have left some dissatisfactions, a feeling that some central problems have not been touched and other important problems ignored. While there has recently been great ferment in the field of medical care, opportunities for a foundation prepared to support analytic studies and experiments have not been as frequent as might have been hoped. Medical education, on the other hand, appears to have been in a process of constant critical reappraisal since the publication of the Flexner Report and there has been ample opportunity for foundation support in this field. Medical educators generally believe that medical education has improved, but the standard employed to reach this conclusion has normally been an internal one. A few schools have been able to measure their success in terms of the number of professors produced or the number of graduates who have entered specialist practice where this is the aim of the school; but so convenient a standard is not available to most schools, the bulk of whose graduates enter general practice. The "quality of medical care" in which the profession is currently investing so much thought and work means good medical facilities and hospitals, sound medical education and well-trained specialists. It also means good general practitioners and they have received less attention than is their due.

The establishment of a four-year medical school at the University of North Carolina was preceded by a critical examination of the need for a third medical school in the state. A national committee convened to study the problem recommended such a move in its 1946 report. In doing so the committee pointed out that the supply and distribution of physicians was governed by many factors in addition to the number of medical graduates and therefore made its recommendation contingent upon the development of a ". . . philosophy of medical education, research and medical care which will make it a service facility to the whole state." Other publicly supported medical schools have undertaken somewhat similar responsibilities in regard to their state facilities, but these attempts to aid practicing colleagues have not been enthusiastically accepted by medical educators. This probably is so because most educators have grave doubts about the value

of the type of refresher education which is the normal method of attacking the problem of aiding practicing physicians. One field in which universities have attempted to provide educational services to a state with some measure of success is that of agriculture in which the extension service had to wait for the development of an effective method before accomplishing its end. The lack of effective method appears to be the problem with the extension of medical education as an extramural service. It was not expected that a study of general practice would answer the question of how a medical school or medical center could make itself a service facility to its state, but it was hoped that accurate information about the most numerous type of practicing physician would be of value to an institution taking up such a challenge.

The creation of a Program Planning Section in the Division of Health Affairs at the University of North Carolina in 1951 to concern itself with collection of information and to examine the division's position in relation to medical care and problems in the state gave further impetus to the location of the study here. The opinions and conclusions expressed in this report, however, are entirely those of the authors and have not been reviewed as expressions of policy by either The Rockefeller Foundation or The University of North Carolina.

Certain events contributed directly to the genesis of this work. The senior author, prior to coming to the University of North Carolina, had spent several years in England, a period that covered the inception of the British National Health Services. In Great Britain specialists or consultants had by custom always worked in the hospitals and general practitioners had largely confined themselves to their offices. Only a small percentage of British general practitioners had or have hospital appointments. The National Health Services which were instituted in 1948 more or less formalized this position. Everything that could possibly be done, through organization, administration and with the necessary backing by the national treasury was done to make the hospitals better. No provision was made for any development of general practice. It was accepted, for example, that the general practitioner would practice in an office and that the difficult, the obscure, the surgical, the psychiatric would be referred to the hospital for care. This in effect left him in charge of a sorting station, a doctor of secondary importance who dealt with the trivial or managed the hopeless, as stated by some cynic. Several investigations which will be referred to later indicated that all was not well with general practice. It appeared to an outside observer that failure to do anything positive to provide for the growth or the augmentation of the practitioner's skill had left general practice stagnant. These are not the authors' opinions alone; they are found in the *British Medical Journal* and the *Lancet* frequently. The feeling that the general practitioner in the United States was receiving less attention than his importance and prevalence would indicate was re-enforced by the observation of the events in Great Britain.

Acknowledgments

A STUDY OF THIS type has so many facets and involves such detail of information that it was necessary to turn to many people of varied talents for advice. It is impossible to thank adequately all the people who have given aid and supplied us with information. It is, however, a great pleasure to acknowledge the large amount of help given by certain people who have given an unusual amount of their time and attention to our problem. The conduct of studies such as this one involves considerable strain and much uncertainty. It is a great pleasure to acknowledge the help received from three physicians, Dr. J. Street Brewer, past president of the North Carolina Medical Society; Dr. Amos N. Johnson, past president of the North Carolina Academy of General Practice; and Dr. Paul F. Whitaker, past president of the State Medical Society, who is perhaps best characterized as a man devoted to the solution of North Carolina medical care problems. The patience with which these gentlemen have listened to our problems, the wise advice which we have received from them on many occasions has been an invaluable aid.

Dr. W. Reece Berryhill, Dean of the School of Medicine of the University of North Carolina, kindly provided us with a letter of introduction to each general practitioner. James T. Barnes, Secretary of the Medical Society of the State of North Carolina, repeatedly supplied information about physicians whose whereabouts were difficult to determine. Dr. Edward L. Turner, Director of the Council on Medical Education of the American Medical Association and Dr. Dean F. Smiley, Secretary of the Association of American Medical Colleges, have kindly supplied us with a second introduction, in this case to the deans of medical schools. Our gratitude should also be extended to the deans and the assistant deans of more than 30 medical schools who supplied information about their graduates. Dr. Henry T. Clark Jr., Administrator of the Division of Health Affairs of the University of North Carolina, Dr. Wingate Johnson, Acting Dean of the Bowman Gray Medical School, and Dr. Wilburt C. Davison, Dean of the Duke University Medical School, assisted us in various ways with advice and reprints of their writing and papers.

There is another group of people whose assistance in this project was of a somewhat different character. William F. Elkin and Miss Elizabeth Doan, graduate students in statistics working for the Program Planning Section, had the onerous task of performing many of the statistical manipulations that were required. Professor Daniel O. Price's department also performed many statistical chores. Professor Alva L. Finkner and Professor R. L. Anderson, sampling consultants of the Institute of Statistics, North Caro-

lina State College, gave important help in planning this study. Dr. Roger Howell, Professor of Mental Health in the School of Public Health at the University of North Carolina, assisted us extensively in the field work, visiting a number of practices and making observations on the psychiatric problems seen in general practice and on their handling. Dr. John M. Weir of the Rockefeller Foundation also assisted us in the field work involved in this study and also with some very pointed advice. Dr. Dwight M. Bissell, Professor of Public Health Administration at the University of North Carolina, lightened the burden of our work by his extensive examination of certain public health questions. The negative character of his findings does not detract from the very valuable help which he gave this study. Rashi Fein of the Department of Economics gave advice on the writing of the section dealing with the economics of practice. C. R. Council of the State Board of Health kindly supplied us with copies of death certificates of physicians over a period of several years. It is a pleasure to acknowledge the encouragement given by Dr. Cecil G. Sheps in the early phase of this study. We have benefited from the advice of many members of the medical school faculty, but special acknowledgment should be given Dr. Warner Wells, Dr. Charles H. Burnett and Dr. Charles Flowers.

It is a special pleasure to acknowledge the very great help provided in this study by Mrs. Marjorie Renner, whose unfailing patience in performing the work of preparing draft after draft of the following report has made life infinitely easier. In the later stages of our work Mrs. J. E. Mann took over this load.

The general practitioners, who gave us so much of their time and answered our many questions, must have felt some sense of strain at having an observer in their practices. To them we owe our greatest debt.

I: Why Study General Practice

THERE IS NO GREAT body of literature for reference in discussing the background of this study, although somewhat similar studies have been done. The fact that general practice in Great Britain had been recognized to have some failings within the National Health Services has been referred to. In the several years since the Services' inception in 1948 there have been three extensive investigations into general practice. The first of these was reported by Collings in 1950.[1] He "sat in on" a number of selected practices and his report is a description of some of these visits. The selection was not random. Dr. Collings seems to have seen mainly very poor doctors though he apparently did not feel that this was the case. On the basis of the types of practice observed his castigation of general practice as a whole was very severe. This report was most provocative but left many questions unsettled. Two further studies of general practice in Great Britain appeared while the present work was in progress. The first of these was by Hadfield who studied a large number of randomly selected physicians.[2] His findings dealt with many aspects of practice including an estimate of the quality of the clinical work being performed. It is mainly descriptive but also critical. Its main purpose was to present "an authoritative view of actual conditions" and this was well done. The last of the three studies, by Taylor, was an examination of "good general practice."[3] As the title suggests, its subjects were carefully chosen and the report dealt competently with the organization and mechanics of these selected examples.

In this country somewhat similar studies have been done. Makover has presented a very brief description of a study of the clinical work within the Health Insurance Plan group practices in New York.[4] A survey of medical facilities in three southern counties, performed by Guild, paints an interesting picture of medicine in the early 1930's.[5] It can be inferred with some confidence that there has been substantial improvement in general practice in the intervening quarter century. This last study was concerned mainly with the economics of practice but presented some interesting data on the extent of laboratory and hospital facilities, and it is on

1. COLLINGS, J. S.: "General Practice in England Today," *Lancet, I:* 555-585, (1950)
2. HADFIELD, S. J.: "A Field Survey of General Practice, 1951-52," *British Med. J., II:* 683-706 (1953)
3. TAYLOR, S.: *Good General Practice,* Oxford University Press (1954)
4. MAKOVER, H.B.: *J. Am. Pub. Health Assn., 41:*824-832 (1951)
5. GUILD, C. ST. C.: Publication No. 23. The Committee on the Costs of Medical Care, University of Chicago Press (1932)

the basis of this latter information that improvement of practice is judged to have occurred.

Most of these studies have been of real value and all of them aided the authors in formulating plans for the present one. Without the example of previous investigations the specific goals of this study probably would not have been readily defined.

Numerical importance of general practitioners

It is obvious that good medical care is determined by many things, but the physician occupies a unique and important position as the central figure. Figures given by Weiskotten and Altenderfer indicate that over half of all medical graduates are wholly or partly engaged in general practice.[1] General practitioners are more widely distributed than specialists. Their general availability and the broad scope of general practice probably means that the kind of medical care received by a large part of the population is determined by the local general practitioners.

The numerical predominance of general practitioners is not the only or even the most important reason for their selection for study. Other fields of practice have been subjected to a process of organization and formalization with respect to training and practice that have almost certainly produced great improvement. The formalization of prolonged training programs and definition of the fields which have become so complete for the medical specialties have scarcely touched general practice in a positive way. When one comes to consider if general practice would benefit from the same type of attention, several questions immediately arise: What is good general practice? How does one train for general practice? What is its relation to the whole of medical practice?

What is general practice?

What is the field, the necessary competence of the general practitioner? The Academy of General Practice states it is whatever the doctor is capable of doing. A specialist or medical educator might limit it to internal medicine, normal obstetrics, pediatrics, minor emotional diseases and minor surgery. This is reasonable but where does the general practitioner's competence stop in any field? He cannot treat all emotional disturbances but which ones should he attempt to manage? What are the common medical problems which he will need to master? What facilities and equipment are necessary or important? General practice is *terra incognita* in contrast with specialty practice where customary limitations define the field and the patients are selected.

An attempt to define or describe general practice involves study of it under varying circumstances. It may change from town to city, with the age of the doctor, with season of the year, with the number of partners or aides, with the size of the physician's income, and with many other factors. It would be necessary to know something about the doctor and his training, his patients and their diseases, his facilities, the extent of his work and any limitation imposed upon his practice. It is possible that organization within each practice might be important.

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1. Weiskotten, H. G. and Altenderfer, M. E.: *J. Med. Educ.* 27: No. 5, Part 2

How does one train for general practice?

A neurosurgeon must be trained in neurosurgery, but how does one train for general practice? Whatever the definition of general practice, it is difficult to avoid the conclusion that the general practitioner must be trained in the whole of medicine, surgery excepted by general agreement. This is an impossible goal, but what should the physician pick and choose in preparing himself for this diverse field? The extensive development of preceptorships has given real point to examination of this question. Any answer to the question of what training would be desirable should be based on factual information. One medical educator states, "At a time when the medical pendulum is swinging further and further toward specialization, the future of general practice offers an endless field of speculation—and endless speculations are being offered about it."[1]

What is the relation of general practice to the whole of medical practice?

While it was intended to examine the internal operation of each general practice carefully it was also hoped that effects of the medical environment on the physician could be evaluated in the ambitious hope that the positive and the valuable on the one hand, and the adverse and the poor on the other, could be identified.

In the last few decades a new note has been injected into the practice situation in the United States by the growth of specialization. Formalization of training programs for nearly every specialty or subspecialty has created a caste system within medicine. Only the general practitioner no longer has a requisite course of training, a certifying board and preferential rate of pay in government service. The predominance of the specialist organizations has put general practice in a defensive situation and has allocated to it largely negative virtues. The creation of certifying boards in medical specialities has closed many doors to the general physician. The hospital restrictions placed upon general practitioners are well known. In many communities it is easier for a specialist to obtain an appointment in the hospital than it is for a general practitioner. Within the hospital, increasing organization and formalization of responsibility have had a tendency to exclude the general practitioner from more and more fields of medical practice. Surgery is often completely forbidden to the general practitioner. In obstetrics his work is frequently limited to the normal delivery. Almost certainly good surgery is more likely to be done by a well trained surgeon than by a partially trained practitioner, but the absence of an over-all point of view in initiating one change after another may unwittingly fasten undesirable patterns upon the medical profession. It is very important that any action taken with respect to general practice should not be exclusively negative in character.

The authors did not approach this study with any theory about what general practice might or should be in ideal circumstances. This study was concerned with the present situation. As stated above, it was hoped that a critical examination of present practice might reveal the extent to

1. Johnson, W. M.: *J. A. M. A., 132:* 1-4 (1946)

which scope, training for, and organization of practice influenced its conduct.

Although general practice was selected for this investigation because it was considered to be an important problem, it is not the only one meriting attention. The fields of medical education and medical care are replete with unanswered questions. In fact, as this report is being completed other studies arising from this one have already begun.

II: Techniques of the Study

A. Purpose of the Study

THE PURPOSE CAN BE summarized by stating that it is an attempt to obtain information and understanding about the problems of the general practitioner in the hope that his educational, training and organizational needs would become clearer. This statement was, indeed, the explanation given to each physician who was asked to participate in the study. Though information and gathering of facts was necessary to its purpose, it was planned primarily as an analytical study. To accomplish the purpose stated above it was felt that the following would be necessary:

1. Information about the general practitioners' patients and the diseases or conditions which bring them to the physicians.
2. Information on the background of general practitioners, their premedical and medical education, training and experience.
3. The type of care the physicians give to their patients.
4. Information on the organization, facilities and personnel available to aid the physician and their effect on his work.
5. Information on the city and area of the physician's practice and its medical activities and facilities, the specialists available, and study opportunities.
6. Information about a miscellaneous group of facts which might influence the physician or alter his work.

B. Preparation for the Study

Preliminary observations

Before this study was begun, extensive preliminary work had been completed. The senior author began this work with a series of visits to about 15 general practitioners, some of whom were selected initially because of their proximity to Chapel Hill. The later visits were extended to other parts of the state where geography or special conditions of practice might be expected to exercise an influence upon the pattern of practice. During these visits notes were made on each patient seen, including age, race, sex and the probable diagnosis. Records were kept of many facts about the physician that were thought to be of potential importance. These observations formed the basis for the detailed records that subsequently were made for each practice included in the study. These pilot studies enabled the authors to decide what questions to ask, in some instances how to ask them, and what observations could be made in each practice. They did not tell which facts were important and which unimportant. The reader will see in subsequent sections that a wide net was cast. That the results were often very different from the expectations requires no apology.

Personnel

Part of the very complicated nature of general practice quickly became apparent in the course of these observations and the characteristics of the persons needed to do the actual research work became clear. It was evident that careful observation was the only method that would produce the information desired. The difference between the theory of practice and actual performance was often very marked so that questionnaires or other research instruments which could be applied cheaply and easily would be of little value in obtaining accurate data. General practice is furthermore so varied that an observer with substantial clinical knowledge was mandatory. In addition many of the clinical problems seen were judged to be in the field of internal medicine. It was also evident that a distinction between a well-organized office and good clinical practice would have to be made. For these reasons two well-trained internists were ultimately selected to make the majority of the observations which are detailed in this volume.

Creation of the population and the sampling procedure

It is of the utmost importance that the physicians selected for such a study as this should be representative. In view of the critical nature of the sampling process, it is described in detail in Appendix I and only a brief outline is given here. In making up the population the Directory of the North Carolina Medical Society was the principal compilation used. All physicians who were listed as general practitioners or were not conducting a practice limited to a specialty were included. From this population a representative, stratified sample was drawn by a random procedure. The stratification was based on the three major geographic areas of the state, three age groups (with physicians over 65 years excluded), urban and rural places of practice and the medical school attended. Because of their small numbers, Negro physicians were not included. It is believed that the physicians studied were typical of the population from which they were drawn.

Among the physicians selected a number were eliminated because of removal from the state, limitation of practice to a specialty other than general practice, death or for other similar reasons. Of 107 general practitioners whose names were drawn, five were excluded because of serious ill health or retirement from practice. Of the 102 actively practicing physicians whose cooperation was sought, only eight refused to participate. This left 94 physicians, and the observations made in these practices form the basis for this report.

Approaching the doctor

Once the physician had been selected for the study, he was first approached through a letter of introduction.* This letter merely stated

* This was kindly supplied by Dr. W. Reece Berryhill.

that a study of general practice was being undertaken and that the physician would shortly be approached for the purpose of seeking his cooperation. At the time of the introductory visit to each doctor it was explained that a study of general practice was being undertaken to find out what its problems were in the hope that conclusions as to its training and organizational needs might be found. It was explained that the observer wanted to spend enough time with the doctor, in his office and on house calls, so that there would be an opportunity adequately to observe and to discuss the doctor's problems and work. The exact time of the observer's visit was arranged and the necessary details explained.

An attempt was made to randomize the order in which the physicians were visited. Due to the exigencies of travel and the observers' personal obligations, it was not possible to shuttle about the state completely at random. For this purpose doctors were grouped and arrangements made so that each portion of the state would be visited during different seasons of the year by different observers so that something very much approaching a random distribution was achieved. An attempt was made also in scheduling these visits to use other procedures that would have a randomizing effect. Itineraries were laid out in such a fashion that the initial visits made to the doctors to explain the purpose of the study and to schedule the subsequent visit of the observer were sometimes made in a clockwise fashion, again in a counter clockwise fashion. At other times visits started close to Chapel Hill and extended towards the periphery of the state while at others they began at the periphery of the state and extended centrally. Visits were normally scheduled *seriatim* in the order of the initial approach. There frequently was difficulty in scheduling a physician for a given date and there were occasional postponements, all of which had the effect of upsetting these attempts at randomization to some extent.

C. Conduct of the Study

The study outline

The preliminary investigation demonstrated that careful observation of general practice was necessary if the data needed were to be obtained. It was necessary for purposes of making accurate observations that a good sample of the variety of patients and their diseases and the challenge they offer to the practitioner should be seen. There was much information that could be obtained only from the physician. Since general practitioners are busy people, opportunities for discussion were often limited to brief periods between patients or while making home visits. It was found that three to three-and-a-half days of observation were usually required for the observer to obtain all the information sought. A very few visits were abbreviated and few were prolonged beyond the mode.

An outline of the questions and the information and observations being sought was provided for each visit. These forms were never shown to the physician but were filled in during the course of the visit or at its conclusion. A list of the subjects on which information was sought is given below and a detailed questionnaire is found in Appendix II.

1. Name and address
2. Family and community background of the doctor
3. Marital status
4. Premedical education, medical education, internship and residency
5. Satisfaction with medical training
6. Practice experience
7. Present practice
8. Why did he go into general practice
9. Satisfaction with general practice
10. Number of doctors in county
11. Physical plant
12. Auxiliary workers
13. Laboratory
14. X-ray
15. Records
16. Clinical routines
17. Limitations on practice
18. Consultants employed
19. Practice arrangements
20. Other medical positions
21. Hours of work
22. Hospital appointments
23. Fees
24. Income
25. Medical societies
26. Journals purchased
27. Postgraduate study
28. Hobbies
29. Civic organizations
30. Civic offices
31. Attitude toward detail men
32. Plans for improvement of practice
33. Relations with public health department

Almost all of these items were further subdivided so the number of specific points on which information or observations were sought probably approached 200. Since some items were found to be valueless and others to be of great importance the details of methods are better left to the appropriate chapters.

In the early part of the study the record made in each practice was immediately reviewed by all members of the research group to ascertain that the information obtained was complete. A list of definitions and explanatory notes had been prepared in the hope of making all observations uniform, but it was found necessary to modify or augment these definitions in quite a few instances, particularly at the beginning. Evidence will be presented later which shows that a high degree of correlation between the observations of the two internists was obtained.

In addition, each physician who participated in this study was asked to complete a standard record form for all the patients he saw during the week of the visit to his practice. The record kept on each patient included identifying biographical data concerning age, race and sex of the patient, the extent of the physical examination, the laboratory work performed on each patient and the diagnosis. A copy is reproduced as Appendix III.

Printed questionnaires were sent to the dean of each of the medical schools from which these 94 physicians graduated. Information was requested concerning the physician's undergraduate academic record, his score on the Medical College Aptitude Test, his relative class standing in medical school and internship appointment. Comments concerning factors which might have affected adversely or otherwise the doctor's performance while in medical school were invited. The questionnaire is reproduced in Appendix IV.

Duration of the study

Preparation for the study began in the Fall of 1952. The observations which constitute the basis for this report began in early July 1953 and were completed approximately a year later. Another two-and-a-half months were devoted to a series of revisits to physicians who had been seen previously.

D. Differential Characterization of Practices

Preliminary observations had been carried out in 15 general practices before this study began. Soon after the study itself got underway it became apparent that there was tremendous variation in the quality of medical care given in the practices visited, a much greater variation than had been witnessed in the preliminary study. At its very best the practice of medicine resembled that carried out in the medical school. At one extreme the physician obtained thorough histories and performed careful, competent physical examinations of each patient. The laboratory which was usually manned by a trained technician was used skillfully as an adjunct to the practice. Other physicians' performances were antipodal. These physicians practiced from their desk chairs. Histories were almost nonexistent and the few questions asked were often irrelevant. Patients were seldom undressed or laid down for examination. Abdominal examinations were performed with patients sitting in a chair. The lack of attention to the patient's safety was demonstrated by unsterile technique in performing venipunctures and hypodermic injections.

This unexpected variation was of fundamental importance and the question immediately arose of how to document it. The standards used by the American College of Surgeons and its successor agency for the accreditation of hospitals clearly were not suitable. Several published studies that have dealt with the quality of medical practice have either failed to specify the methods used or have been so different that they were not applicable for the purpose of this study.[1,2,3]

The qualitative ranking system

In the early phase of this study, before the import of the great variation in practice performance was fully appreciated, it was customary to describe physicians' practices in terms of good, fair or poor. These descriptions were based upon the efforts made by the physician to arrive at a diagnosis and his handling of the problem once it had been identified. The observers believed that three clear-cut levels of performance were distinguishable. Since the physicians were distributed on a continuum, intermediate classifications were used for physicians who did not readily fall into the three groups. Thus the lowest performance was characterized as Roman numeral I, with Roman numerals II, III and IV representing ascending scales to the highest, Roman numeral V. These classifications provided no evidence in support of the judgments made. An attempt was therefore made to remedy this deficiency.

The quantitative ranking system

A physician's first responsibility to his patient is to make a diagnosis. The well-tried methods for reaching this goal are by taking a history, performing a physical examination and the indicated laboratory work. These

1. Makover, H. B.: *J. of the Am. Public Health Assn., 41*:824-832 (1951)
2. Goldman, F. and Graham, E.: *The Quality of Medical Care Provided at the Labor Health Institute:* The Labor Health Institute, St. Louis, Mo. (1954)
3. Hadfield, S. J.: *British Med. J.*, pp. 683-706, Sept. 25 (1953)

were accordingly used as the major criteria for classifying each practice. In addition, observations were made as to therapeutic measures employed by a physician, his efforts at preventive medicine, including antenatal and well-child care, and the extent of his patient record system.

Greatest importance was attached to the process of arriving at a diagnosis since, without a diagnosis, therapy cannot be rational. Furthermore, therapy is in the process of constant change, while the form of history and physical examination has changed very little over the years.

Early experience indicated that many variations in performance lent themselves to differentiation on a purely descriptive basis. For example, examination of the heart in one practice might be limited to auscultation at the base, while in another practice it might include inspection, palpation, percussion and careful auscultation over all valve areas. Similar descriptions of varying performance were designed to cover most aspects of patient examinations. Since different levels of performance in all situations were not so easy to describe as in the case just cited, the attempts involved some trial and error with revisions being made as experience increased. A system weighting the descriptions was adopted with O normally being given for the poorest performance while weights 1, 2, etc., were given for progressively higher levels of performance. The sum of the weights given for each division of the clinical performance are as follows:

Clinical history	**30**
Physical examination	**34**
Use of laboratory aids	**26**
Therapy	**9**
Preventive medicine	**6**
Clinical records	**2**
	107

The weights were deemed proportionate to the importance of each item in the schema of patient care with approximately 100 points allocated to the history, physical examination and laboratory investigations and treatment.* Details of the quantitative system are given in the next chapter.

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* The relative importance of the six categories observed in the quantitative index of performance was determined by judgment. Reasons for the judgment have been outlined in the foregoing section.

After the individual scores in the six categories were observed on 88 physicians who could be graded, it was possible to correlate each of the six scores for all physicians with every other score. This resulted in a correlation matrix analogous to the type used in factor analysis and developed in connection with psychometric research.

Factor analysis methods, such as proposed in the text "Multiple-Factor Analysis" by L. L. Thurstone, were employed to help discover the underlying order or structure in the set of six areas of competence observed for each physician. That is, the assumption was made that the correlations in this matrix were probably influenced by some primary factor common to all six categories. Thus, a physician's performance in each of the six categories might have been determined in part by the skills required only in that category and in part by his ability in the primary factor common to all categories. One of the purposes of factorial methods is to determine the extent to which each category contributes to this common primary factor or factors.

For example, if the group of physicians were rated instead on six independent tests of gymnastic ability, the underlying structure which influenced in varying degrees the results on all tests might be a primary factor such as sense of balance. If sense of balance per se were to be predicted, combination of the scores on all six tests would obviously

In using this outline, a description of the physician's work was completed by checking the items that fitted the situation. Where the fit was not perfect, the most appropriate item was checked and explanations were added by the observers. It was not always possible to characterize the doctor's performance on each subdivision of the six main sections because it sometimes happened that no patient with a complaint or disease specifically requiring examination of a particular part was seen during the period of examination. In applying the weights a percentage had to be employed based upon the items that were observed.

Comparison of the two ranking systems

The use of these two systems yielded two numerical descriptions of the quality of each practice, the subjective, qualitative or ordinal description expressed as a Roman numeral (I-V) and the more concrete quantitative one expressed as an Arabic numeral (1-107). However, the physician-observer designated the quality of a practice by ordinal grade rank at the termination of his visit and a numerical quantitative rank was subsequently calculated by another member of the research group. The correlation coefficient between the ordinal and the quantitative grading schemes was 0.86, an exceedingly high correlation in view of the fact that the ordinal value was a discrete variable with only five possible values, whereas the other was spread over a range more than 20 times as great. The advantage resulting from this very high correlation is that the analysis of factors affecting the quality of practice can usually be studied in terms of either system, whichever is easier numerically.

———— *(cont'd)*

be better than any single test score by itself. Similarly, since the purpose here is to measure "over-all capacity for goodness in medical care," if we assume that the first factor does, in fact, reflect this, then the relative portion of each category determined by this factor constitutes a weighting coefficient to combine the six categories into a new composite index.

The first factor isolated by factorial methods constituted 53 per cent of the residual variation. Two methods were utilized for isolating the first factor, i.e., the first was principal components of the total variance and the second was simple orthogonal structure obtained by using communalities followed by rotation of the matrix. The contributions of each of the six categories toward the first factor, called individual loadings, were squared to determine the coefficients for a new composite index as follows:

Category	Coefficient	
	Principal components	Simple orthogonal structure
Case history	0.72	0.76
Physical examination	0.69	0.69
Laboratory	0.44	0.18
Therapy	0.48	0.25
Preventive medicine	0.40	0.34
Records	0.44	0.28

The two sets of coefficients pointed to the fact that case history and physical examination were the most important determinants in this first factor. The coefficients found in the simple orthogonal structure, in fact, were more in accord with the ones actually employed. If the factor analysis method were accepted as final judgment, however, the results indicate that case history should have had slightly more influence in the final index, laboratory considerably less, and preventive medicine and records somewhat more. On the other hand, when indexes of "overall capacity for goodness" were constructed using the factorial weights, the resultant values were practically identical, correlationwise, with the judgment type of quantitative index employed in the analysis. Consequently, the indexes by factorial methods were used only as confirmatory evidence that the quantitative index appeared to be satisfactory.

The authors should like to thank Dr. B. J. Winer, now at Purdue University, for the factor analysis of the correlation matrix.

Because the detailed quantitative outline was not in use in the early phase of this study, pertinent information was lacking with respect to some practices. It was possible to complete quantitative descriptions of some practices from notes made at the time of the original visit but a considerable number of practices had to be revisited.

Reliability of observations

The reliability of the observations was measured by having each of the two observers visit and grade seven of the physicians previously visited by the other. Some of the variation between the two observers in these 14 cases might be attributed to the fact that the second series of observations, even if performed by the same person, would show some fluctuations from the original observations. To measure this within-observer variation, each of the two observers also revisited four of his own previously visited physicians. Altogether this information provided eight opportunities for measuring the extent of within-observer variation to compare with the magnitude of the between-observer variations. Only in the case of the section describing the physical examination was the variation between the observers significantly greater than it was when the same observer repeated the visit. The within-observer variation was also found to be slight in the case of the physical examination.

In half of these 14 between-observer revisits there was agreement as to the physician's ordinal rank grade. Among the others the divergence between the two observers never extended beyond the adjacent ordinal grade. The 14 physicians visited by the two observers were also ranked according to the quantitative system by each observer. The correlation between these total weighted scores was a high positive value indicating the high reliability of these measurements. This meant that the observations of the two observers in five of the six major divisions could be pooled for analytical purposes without any adjustment for observer differences. In the case of physical examination, Observer A was consistently higher than Observer B. Without any knowledge as to which of the two observers might be more nearly correct in his judgment, the observed scores on the physical examination assigned by Observer A were multiplied by a figure less than one, whereas the corresponding scores by Observer B were multiplied by a comparable figure greater than one so chosen that the resultant averages were identical. Following this adjustment for bias the scores were ready to be considered on the same basis as the scores in the five remaining areas since the within-observer variation was slight.

In the areas of history taking and physical examination, there was close agreement between the independent scorings provided by the revisits of the two observers. The correlation coefficients were $+0.72$ and $+0.78$, respectively. In the four other areas in which judgments were made, there was close agreement but not of the same magnitude. However, in no instance was the difference between observers greater than that which resulted from two visits to the same practice by the same observer. This lower correlation for between-observer and within-observer scores is explained, at least in

part, by the fact that only one day was allotted to revisits. In this short period of time clinical situations providing opportunity for judgment did not always appear; therefore, all revisited practices could not be fully characterized on the quantitative scale.

Validity of observations

The observations recorded in this report were made almost entirely by two internists; three practices were visited by a third internist. In order to learn the actual mechanics of general practice, these physician-observers followed as closely as possible the cooperating physicians throughout their daily routines in the office, on hospital rounds and house calls. The point immediately arises whether a physician under such circumstances might attempt to alter his habitual patterns of practice in order to create a more favorable impression of his performance. This possibility is a real one and the action of such a factor cannot be excluded with certainty. Nevertheless, certain points militate against it. It is difficult abruptly to change established habits and reaction patterns and even less likely that alterations could be consistently maintained for the three or four day period during which observations were carried out. As noted previously, a physician was not informed that assessment of the level of his performance was one of the objectives of this study. Although some physicians grasped this purpose, it seems very improbable that physicians significantly altered their habits greatly during the period of observations; however, it is impossible to gauge the extent of the possible bias.

This study was conceived, conducted and analyzed from the viewpoint of internal medicine. The observers did not feel competent and made no effort to judge actual surgical or obstetrical techniques. However, correct diagnosis, good patient management and aseptic technique are common to all forms of medical practice, and it was believed that a physician's performance in these areas probably did not vary significantly from his performance otherwise. Indeed, evidence will be introduced to substantiate this belief. Data on the morbidity seen in general practice indicates the preponderance of conditions falling within the purview of general medicine. The general practitioner normally sees unsorted, unclassified patients; his is the role of first line diagnostician. Therefore, emphasis on the diagnostic procedures commonly associated with internal medicine appears justified. The observations of the psychiatrist who made supplementary visits to some of these practices will be presented separately.

III: Description of Clinical Practices

A. General Results

Results of use of the ordinal system

ALTHOUGH 94 PHYSICIANS were visited, the practices of only 88 could be characterized for purposes of comparison. In two instances in which a rank could not be assigned, the physicians were employed as full-time industrial physicians and it was not believed that their practices could be adequately described within the framework of the method. In another two instances the patient-load of the physicians was very light, amounting to only one or two patients per day; this did not provide adequate opportunity for observation. In the remaining two instances the physicians involved felt that the presence of a third person would be detrimental to the physician-patient relationship, and they therefore declined to permit the observers to make the necessary clinical observations. These two physicians were fully cooperative in other ways and provided much valuable information and material for other aspects of this study.

The use of the qualitative or ordinal system of ranking resulted in the following distribution of the 88 physicians:

	V	IV	III	II	I
Number of Physicians	7	15	27	23	16

These qualitative ranks are based on general impressions gained by the observers. Ordinal or Qualitative Rank V denotes the highest order of performance that was observed, while Qualitative Rank I denotes the lowest; the intervening ranks describe performances of intermediate caliber.

The physicians whose performances placed them in Qualitative Rank V were considered outstanding in nearly all respects. In obtaining clinical histories, these physicians carefully organized their questioning to develop the symptomatology surrounding the presenting complaint. Thoroughness, attention to detail, and the logical sequence of questions designed to explore functions of organ systems indicated ample medical knowledge. In performing the physical examination they were thorough and showed that they were using the information obtained from the history purposefully in their search for physical stigmata of disease. In the choice of laboratory procedures these physicians again demonstrated the train of thought on which they built their evidence for diagnosis. The ease with which this train of thought and plan of investigation could be grasped by the observer was characteristic of these very good practices. With a sound diagnosis based on good evidence rather than supposition and intuition, the treatment prescribed was nearly always rational. It was possible to point out a few

shortcomings in the practices of most of these physicians, but these were generally minor and not of a fundamental nature.

On the other hand, the physicians in Qualitative Rank I demonstrated an entirely different concept of the methods of patient care. They evinced almost uniformly a superficiality and lack of thoroughness in their approach to the clinical problems encountered in practice. In history taking, questions were few, usually disconnected and lacking in incisiveness. These gave little evidence that the physician was thinking in terms of probable diagnoses. They were not planned or designed to explore the function of specific organs or physiological units. The physical examination was usually sketchy and it was frequently difficult to understand, in view of the patient's history, why one area was chosen for examination and another ignored. The laboratory tests performed by these physicians were few, often poorly performed and showed the same lack of direction. Under these conditions the indications for specific treatment were usually lacking or unclear, and the treatment rendered gave ample evidence of this uncertain state of affairs. Throughout the handling of each patient this lack of direction and purposefulness made it difficult for the observer to follow the physician's reasoning.

In Qualitative Rank III have been placed the physicians whose performances were clearly intermediate. These were the "average" physicians. A physician's ranking in the third order did not result from averaging a good performance at one time with a poor performance at another. These doctors routinely performed at an "average" level throughout their practices.

There was a remarkable consistency in the performance of the individual physician. That is to say, if he scored high on history taking his performance in the other categories tended to be of the same order. If he did not perform a careful examination, it was unlikely that he would obtain a good history or prescribe rational treatment.

There is no doubt concerning the real differences in performance which caused one physician to be placed in Qualitative Rank V while another was placed in Qualitative Rank III or I. These three groups stand out clearly without overlapping. However, the boundaries between Rank IV and its adjacent groups or between Rank II and its adjacent groups are not so sharply defined. In other words, there may be overlap between ranks, but this does not extend beyond one adjacent rank. Mention has been made of the device used to check the reliability of the observers; this consisted of a revisit by one principal observer to a physician previously visited and ranked by the other principal observer. In 14 such revisits and independent scorings the variation in scoring never amounted to more than one qualitative rank. This attests not only to the high degree of reproducibility of results between the two observers but also to the reality of the distinctions drawn between the practices studied.

Results of use of the quantitative system

Table 1 depicts the results of use of the quantitative grading system and also compares these with the results attained by use of the previously

TABLE 1

Comparison of Qualitative Rank with Quantitative Score

No. Physicians (88)	Qualitative Rank	Mean Quantitative Score*						
		Total Mean Score**	Clinical History	Physical Exam.	Use of Laboratory Aids	Use of Therapeutic Measures	Preventive Medicine	Clinical Records
7	V	71.5%	76.0%	62.0%	73.0%	77.4%	80.9%	80.0%
15	IV	58.2	53.0	53.0	66.2	56.9	87.2	75.0
27	III	37.5	28.7	34.0	47.1	40.4	62.2	35.0
23	II	25.4	17.7	19.1	38.9	24.4	48.5	30.0
16	I	20.6	15.7	16.4	28.1	11.7	49.3	15.0

* Expressed as percentage of total possible weights which could be applied to each practice.

** The total mean score is the average of the total weights for each physician in that qualitative rank. Each physician's total score was calculated as follows:

1/107 [30 (percentage for history) +34 (percentage for physical exam.) +26 (percentage for use of laboratory aids) +9 (percentage for therapy) +6 (percentage for preventive medicine) +2 (percentage for records)]

described ordinal system. The total mean quantitative score represents the mean percentages of the sums of the numerical weights assigned to the detailed descriptive items for each physician standing in the corresponding qualitative rank. Use of these systems provided results which were in very close agreement ($r = 0.86$) so that for all practical purposes either figure may be used to describe a practice. However, throughout the remainder of this report the five qualitative ranks have been used for most of the comparisons. This has been done because this system allowed for use of fewer figures in describing a physician or a group of physicians. For these statistical manipulations the qualitative ranks have been weighted with the same number as the Roman numeral rank designation.

Use of examples

In the following sections a number of examples are cited to provide graphic illustrations of the practice habits that were encountered. Many examples were, of course, available. The ones recounted were chosen to show the wide variation in professional performance which characterizes general practice. The presence of more examples of inadequate practice than of good practice is explained by the fact that departure from the optimum is frequently dramatic and more impressive. Many examples of top performance were, of course, encountered; however, these were the familiar, the expected, and as such, were less frequently catalogued. Also, this was a critical study in which an attempt was made to identify factors of interest to medical educators in formulating a plan of training for general practice. With this purpose in mind the reason for focusing on deficiencies should be evident.

B. Clinical Observations

The Medical History

The use of a check sheet or itemized list was not feasible in describing a medical history. Therefore, a somewhat less convenient but workable method was adopted. Early histories were grouped into three qualitative classes. The distinctions made were valid, but it was soon realized that different levels of performance could be discerned within each of the broad categories. For instance, a group of examples of history taking might all be described as good, but it was apparent that some were better than others. Accordingly, a system of numerical weights was devised to give expression to the various degrees of quality. The use of numbers would also permit statistical calculations which were desirable and important.

The following form evolved from these considerations:

(0 - 10) points were given if the history was limited to the presenting complaint or the involved organ. If the history was nonexistent, the value was assigned 0. Questions as to periodicity, duration, severity, location and other questions largely limited to the patient's presenting complaint might raise the value to a maximum of 10.

(11 - 20) points were given for histories in an intermediate position. Histories in this class indicated that the doctor was giving attention to the organ involved and the possible diagnosis and complications. Some questions relating to past history and the major organ systems were asked. The incompleteness, the lack of knowledge, and lack of interviewing skill served to distinguish histories in this class from those in the next higher.

(21 - 30) points were given for very good history taking. Histories graded in this class gave evidence that the doctor was thinking in terms of the organ involved and the possible complications. There was evidence that the doctor was thinking of all possible diseases and trying to assess these by his questioning. Classification in this group was limited to doctors who elicited some past history and who determined the presence or absence of symptoms in the major organ systems other than that involved in the presenting complaint. Skill in interviewing was given credit here. Clinical knowledge is necessary in history taking and credit was given for evidence of it.

As a means of validating these numerical scores and of giving them actual substance, histories typical of those encountered in each practice were recorded as nearly verbatim as possible by the observer. During the course of the preliminary study it was found that note taking during the physician-patient interview was disturbing to some doctors. As a result the histories were recorded at a later time, usually within a few minutes or an hour. In the case of the shorter histories this time element is of little or no consequence. However, it seems safe to say that the longer, more complete histories probably suffered somewhat more by this delay in recording.

In the interest of uniformity and to facilitate subsequent comparisons, examples of histories relating to a few specified disease categories were selected. These categories were upper respiratory infection, chest and abdominal pain, hypertension, anemia and disease of the female genital tract. This list was chosen somewhat arbitrarily with no pretense of completeness; on the other hand, there were several reasons for believing it would serve the purposes at hand. These conditions were frequently seen. These subjects also cover a wide range of organs and possible disease entities so it was reasonable to believe that problems in these categories would provide a challenge to the physician's clinical skill. Experience in the pilot study had indicated that history taking was apt to be particularly limited in the investigation of hypertension and anemia. Therefore, inclusion of these categories would be expected to allow for a more critical evaluation of a physician's skill in history taking.

RESULTS AND EXAMPLES

The following distribution of physicians was obtained when they were graded on history taking:

21-30 points	**8 physicians**
11-20 points	**26 physicians**
0-10 points	**52 physicians**

Two doctors seen in the very early phase of the study were not graded by this numerical system.

In some instances the history was used skillfully to probe the nature of the patient's presenting complaint. When a good history was taken the doctor's thinking was easy to follow. His fund of clinical knowledge and

grasp of the importance of the history in the examination of the patient were usually evident. The physician whose exploration of a patient's presenting complaint gave evidence of clinical knowledge was also likely to complete his interrogation with a review of the past illnesses, organ systems, and family history.

At the opposite extreme were found histories that gave little evidence of clinical knowledge or skill. In some practices the observer felt that potentially serious complaints were explored in a very superficial manner or their seriousness not grasped. In some instances the almost random, unrelated questions put to a patient indicated that the physician was, at best, not systematic. In some practices, clinical histories were normally so brief that they were manifestly unsatisfactory.

Almost no good histories dealing with anemia or hypertension were observed. The former was often regarded as a disease entity rather than a finding which may be produced by diverse causes. Only rarely was an effort made to determine the cause and the possibilities were even less commonly explored through the medium of the history. In the case of hypertension the situation was similar. Historical data dealing with either the etiology or the effects of hypertension was only rarely obtained. Preoccupation with the blood pressure reading was very common.

In a few instances the observer felt that a physician who had taken a good history drew the wrong conclusion from it, but this was rare.

Psychiatric histories

Some comment on the technique of examination and therapy in regard to patients with emotional problems seems warranted. Most physicians recognized these situations in some of their patients and several physicians seemed psychologically prepared to make an attempt at handling them. However, professional preparation appeared inadequate, a fact recognized by most of the general practitioners. No instance of planned psychiatric history taking was observed during this study, though some physicians attempted to treat emotional problems. On some occasions the observer was excluded from the interview between the doctor and patient and it is, of course, impossible to assess the quality of the anamnesis obtained under these circumstances. A few doctors set aside special time in which emotionally disturbed persons were encouraged to talk or discuss their problems. While some physicians did not seem willing to give the patient the time to "talk it out," others appeared unable to convince their patients of their willingness to listen.

Clinical histories and records

One often hears the statement that the general practitioner does not need to keep extensive case records, nor does he need to take a detailed history each time one of his patients consults him. This is said to be true because the general practitioner knows all of his patients and their families intimately. In the beginning of this study there was the inclination to accept this statement as a fact, and attempts were made to document it. However, as experience was gained, doubt as to the validity of the statement

began to appear. It was apparent that physicians did know many of their patients quite well from the sociological aspect. This was more apparent in small towns and rural areas where personal relations are apt to be on a more familiar footing. For example, the doctor in such a locality was likely to know a patient by his first name, that he had a backward child, how many relatives resided in his home, that his brother was in jail, etc. However, it was frequently discovered that the physicians could not recall many medical details about their regular patients. When one physician was queried about a surgical scar, he was able to recall that he referred the patient to a medical center some months previously, but he could not recall what was troubling the patient at the time or what procedure was carried out at the time of operation. Furthermore, this physician had no record with which to refresh his memory as to the date or type of operative procedure.

To expect a physician to remember all or even most of the facts about three or four thousand patients whom he has seen a variable number of times in the preceding year or two is to expect prodigies of memory beyond human capacity. When he sees patients at the rate of 25 to 50 a day, all pertinent details simply cannot be retained. Knowledge concerning a patient's socio-economic status is extremely valuable to the physician, but it is no substitute for an intimate acquaintance with his medical history. Indeed, the two should be complementary, not mutually exclusive.

The Physical Examination

METHODS

When the need for detailed information to substantiate judgment about a physician's level of performance was recognized, a check list was adapted from an outline for the physical examination; the outline proposed in the 13th edition, 1942, of Cabot and Adams, *Physical Diagnosis*, page 21, was used for guidance. Some of the modifications incorporated in this form resulted from experience gained during the pilot study and the early portion of this study. For instance, the first category in the outline pertains to disrobing for examination. Inclusion of such a detail was dictated by the observation that some physicians do not require adequate exposure of the body parts to be examined.

The next step in the formulation of this outline was designed to give expression to the varying degrees of completeness with which a physician might examine a particular organ or system. By the time this point in the study had been reached it was apparent that "examination of the eyes" meant different things to different physicians and that the thoroughness of such examination varied accordingly. Therefore, each of the 20 main categories was subdivided into two or more items as an aid to providing as complete a picture of the doctor's performance as was possible.

Several revisions in the form were made in an effort to provide clearcut differentiation between the levels of performance which were observed. Ultimately this outline worked well and served a useful purpose in terms of facilitating the gathering of detailed information. Additional refine-

ments can be proposed. An additional item might be added to Category 5 (examination of the nose) to indicate examination of paranasal sinuses by transillumination and palpation. Similarly, Category 6 (examination of the mouth) might well be expanded to include an item covering the use of a pharyngeal and laryngeal mirror. These examinations were observed only in the latter part of the study at which time inclusion in the outline did not seem feasible. Other examinations were purposely excluded because they require no overt action on the part of the physician (for instance, assessment of body habitus) and therefore the physician-observer could make no judgment as to whether or not the examination was carried out.

Increasing experience uncovered problems of application which required revisions, interpretations and decisions sometimes of an arbitrary nature. For instance, in the beginning of the study it was assumed that most, if not all, physicians performed complete physical examinations on all new patients and on old patients who had not been seen recently. That such was not the case soon became evident as did the fact that complete head-to-toe examination was the exception rather than the rule. With these considerations in mind it was necessary to compromise and employ criteria to conform to reality. Thus it was decided that the final description or profile of physical examination would not reflect specifically the extent and thoroughness of any one physical examination performed by that doctor. Rather, the scoring on each category reveals the quality of his performance in examining that single physical part, and the total score indicates performance of a hypothetical composite physical examination. Although a physician might rarely feel that it was necessary to perform a complete head-to-toe physical examination, he must of necessity perform abbreviated regional examinations as indicated by his patients' presenting complaints. Thus a high score on physical examination indicates that thorough examinations of various limited regions were performed well and when indicated. It is not believed that absence of a notation concerning the frequency with which a physician performed a complete head-to-toe examination is a serious one for these purposes; in general the physicians who made the most careful examination of individual organs or regions also performed the largest number of complete examinations.

The composite score for physical examination has two components: the first is based on the thoroughness of examination of the various organs and regions of the body, while the second is based upon the thought and knowledge exhibited by the physician in selecting which organs or regions were most likely to be the seat of pathology in each individual case. In other words, once the physician has committed himself to a policy of incomplete examination he must then be highly selective and discriminatory in the decision as to which organs and which regions will be examined.

Two points bearing upon this situation were considered by the physician-observers in their evaluation of each physician's performance. First, it was realized that a physician might not always examine an organ or region with the same degree of thoroughness. For instance, in the case of a patient with a "cold" the physician might not examine the patient's

abdomen or if he did, he might limit his examination to a very superficial palpation. Such an examination would ordinarily be given scant credit, if any. However, if he extended this routine examination to a more complete and thorough palpation for tenderness, organs and masses in the abdomen when faced with a situation which by history or physical examination indicated the real possibility of intra-abdominal disease, it was agreed that this physician should receive full credit for his better performance when it did not appear to be an isolated example out of line with his performance in other categories. The second point logically follows. It was considered that examination of a particular region was deserving of credit only if the physician "thought of it himself," in the sense of exhibiting some clinical judgment in selecting an organ or part for examination. In other words, if the patient literally pointed to a specific organ or region as being the diseased area it required little thought or imagination on the part of the physician to examine this area. For instance, digital examination of the rectum is clearly indicated by the patient who complains of slight rectal bleeding. One physician performed such an examination in such a case, but he was not given credit for performance of rectal examination in final evaluation because subsequently in examining an elderly man with pyuria and complaints of nocturia and frequency, the physician neglected to perform a rectal examination. Such interpretations as this were designed to indicate whether the physician was giving some thought to his actions or whether he was merely going through the motions of doing what a patient had requested or expected. The physician-observers habitually made notes on the forms detailing the circumstances involved in these decisions. This method allowed for defense of such arbitrary actions.

Differing viewpoints and methods of interpretation by two observers presented some difficulty. A physician's examination of a patient is not amenable to exact measurement with a manometer or a caliper; it is a performance, the description of which must be colored by the observer's own feelings and experiences. This factor was recognized when the first attempts to evaluate performance levels were made. Intensive efforts were directed towards further standardization of procedure, and interpretations were made in an attempt to eliminate possible points of divergence. However, all differences could not be resolved and this remains one of the limitations of the method.

In the following pages a more detailed discussion of the criteria used in arriving at these numerical and qualitative evaluations is presented with the results of these evaluations. The number in parentheses following each category heading indicates the number of physicians whose performances could be characterized in this fashion. The number of observations made varies from category to category for several reasons. In the case of some of the practices visited in the early part of this study before the institution of the outline form, information available is insufficient to permit adequate description. Several practices were revisited in an effort to obtain more information, but this was not possible in every case. In some of the smaller practices observations were not made in every category because no patient

with a complaint positively indicating a detailed examination of a given area presented himself during the several days of observation. The percentage of physicians classified in each category is given at the margin on the right.

The figures presented here cannot be accepted as exact measurements; however, all the evidence indicates that they represent an accurate and reproducible estimate of the over-all quality of physical examination as performed in the practices visited.

RESULTS

Category 1. Disrobing for Examination (87 physicians)

Examination performed with patient dressed or almost completely dressed	45%
Patient sufficiently undressed to allow easy access to parts being examined	55%

Disrobing for a physical examination is so necessary to its accomplishment that it may be regarded as laboring the obvious to raise the question. However, early experiences indicated neglect of this prerequisite to examination in some practices. Physicians were observed attempting to perform auscultation of the heart or lungs through several layers of clothing or dropping the stethoscope chest piece down through the open neck of the clothing in this attempt. Similarly, several physicians failed to recognize the impossibility of feeling a soft, rounded liver edge through several layers of heavy clothing.

Adequate illumination, preferably with daylight, is as essential to the performance of physical examination as is exposure of areas to be examined. Although no precise tabulations concerning this factor were made, it was noted that several physicians had failed to make provision for daylight.

Category 2. Examination of the Eyes (84 physicians)

No examination or examination limited to inspection of the conjunctivae	74%
Examination of conjunctivae with occasional determination of visual fields or pupillary reactions or extraocular movements	24%
Complete examination of visual fields and pupillary reactions and extraocular movements in addition to examination of conjunctivae	2%

Inspection of the conjunctivae has been mentioned as a simple method for estimation of the hemoglobin content of the blood. Others have compared this method to the filter paper method of Tallqvist, only to condemn both for lack of accuracy. Inspection of the conjunctivae carried out in a minimum of time frequently gives significant information; however, its selection as the only method of examination of the eyes indicates a lack of discrimination and appreciation of the evidence of anatomically remote disease which may be found by examination of the pupils or extraocular movements. Nevertheless, this was the commonest extent of the examination of the eyes.

Category 3. Ophthalmoscopy (85 physicians)

Never done	66%
Performed occasionally	23%
Performed with frequency indicated by clinical conditions	11%

Despite the acknowledged value of ophthalmoscopy in following the course of hypertensive vascular disease, the procedure was not carried out with the frequency that was indicated; actually, relatively few hypertensive patients were subjected to this evaluation. For instance, one elderly man with this disease had been under the doctor's care for several years, and the clinical record indicated that clouding of the sensorium had been noted on a few occasions. Yet, the eyegrounds had never been examined. Hypertensive disease is prevalent; however, in assessing the severity of the disease, it appears that the emphasis has been misplaced on determining the height of the pressure rather than actually observing the evidence of vascular damage. The same criticism applies to the management of diabetes. Some doctors owned ophthalmoscopes but never appeared to use them, while a few apparently did not possess one.

The following illustrates failure to award credit because of a glaring omission despite the fact that the physician usually performed well in this area. On the occasion of a routine prenatal visit late in pregnancy, a young woman complained of headache and blurring of vision. It was determined that her blood pressure has risen sharply, but ophthalmoscopy was not performed. This latter examination probably would have not altered the diagnosis, but it would have been expected to yield valuable information.

Category 4. Examination of the Ears (85 physicians)

Ears not examined with otoscope	**14%**
Examined with otoscope only	**82%**
Otoscopic examination plus hearing test: watch or whisper perception, bone vs. air conduction	**4%**

Few physicians totally neglected the ears. The usual examination consisted of inspection of the external canal and the tympanic membrane. Main concern appeared to be with the possibility of middle ear infection. A rare physician examined the external ear for presence of gouty tophi, abnormal stiffness of the cartilage, or sought for mastoid tenderness. It is interesting to contrast the frequency with which the otoscope and the ophthalmoscope, remarkably similar instruments, were used. Only 4 per cent of physicians proceeded to make some test of hearing function or do differential testing between bone and air conduction.

Category 5. Examination of the Nose (84 physicians)

Not examined when indicated	**44%**
Examined	**56%**

Although respiratory disease, both infectious and allergic, usually constitutes a large segment of general practice, inspection of the nares is frequently omitted.

One of the imperfections of this grading form is apparent in the absence of a subdivision of this category to allow for awarding of credit to a physician for palpation and transillumination of the accessory nasal sinuses. No tabulation of the frequency of this examination was made, but review of records indicates that about 15 per cent of physicians made this examination.

Category 6. Examination of the Mouth (85 physicians)

Inspection of the tonsils or throat only	**38%**

Complete inspection of the mouth, tonsils, throat, teeth, gums and tongue.....62%

In some cases this examination appeared to be directed only towards the detection of tonsillar or pharyngeal infection. These figures indicate that the mouth and throat are usually fairly well examined although in some cases the examination was very brief. At least two physicians extended examination of this region to include visualization of the vocal chords with a laryngeal mirror.

Category 7. Examination of the Neck (84 physicians)
Not examined.....33%
Examination limited to submaxillary lymph nodes.....46%
Examination includes lymph nodes, thyroid and mobility of neck.....20%

One excellent physician demonstrated three minimally enlarged but palpable thyroid glands on patients coming to his office during one day. More often, however, if thyroid enlargement was pointed out to the observer the gland had usually attained such size as to attract the patient's attention. At no time was a physician noted to employ the technique of auscultation over the thyroid gland. Determination of the range of motion of the neck and palpation of the posterior cervical lymph nodes and carotid arteries were noted only infrequently.

Category 8. Examination of the Lymph Nodes (74 physicians)
Never done.....43%
Done in part.....50%
Examined completely..... 7%

Most physicians who examined these organs confined their efforts to palpation of the axillary and anterior cervical lymph nodes, neglecting the posterior cervical chains. Indeed, one physician made the diagnosis of measles in a child, but failed to search for enlargement of any lymph nodes. Specific examination of regional nodes draining an area of infection was seldom seen. One doctor in his initial examination of a patient with an infection of the foot and ascending lymphangitis made no attempt to palpate either popliteal or inguinal nodes. Alertness to the significance of lymphadenopathy as a sign of the spread of infection or intrinsic disease of the lymphoid and hematopoietic tissues was not widespread.

Category 9. Examination of the Chest by Percussion (86 physicians)
Not done.....60%
Chest thumped perfunctorily.....17%
Percussion over all major lobes, determination of diaphragmatic level, diaphragmatic movements.....22%

Percussion of the chest is one of the examinations which has become symbolic of the doctor's work. In a large number of practices this examination was omitted completely. If performed, it was sometimes limited to small areas, anteriorly or posteriorly, rarely both. Even patients with upper and lower respiratory infections, which were numerous in most practices, frequently were not examined by this method.

Category 10. Examination of the Chest by Tactile Fremitus (85 physicians)
Not done when indicated.....94%
Done when indicated..... 6%

This method of examination was encountered even less frequently than was percussion of the chest. It may be argued that this method is infrequently productive of significant information in the absence of obvious pulmonary disease. However, even in the presence of complaints referable to the chest and lungs, this examination was rarely made.

Category 11. Auscultation of the Chest (86 physicians)

Not done or performed through the clothes	23%
Only part of the chest auscultated (e.g., single area, in front or back)	33%
Auscultation over all lobes with apparent care	44%

It is evident from these figures that auscultation of the chest enjoys a wider usage than does examination by percussion and palpation. It has been argued that these time honored methods of examination under discussion have been largely outmoded by the general availability of X-ray facilities. That each method of examination has a definite place in medical practice today is incontrovertible. However, this argument is not germane to the present discussion since the majority of patients observed during the course of this study were subjected neither to radiographic nor to thorough physical examination of the chest.

Category 12. Examination of the Heart (87 physicians)

Auscultation of the base or other single area of the heart	65%
Adequate auscultation of all areas plus percussion of heart or palpation of heart	30%
Good, complete examination of the heart including auscultation, palpation and percussion	5%

The most frequent cause for failure to earn credit for a good examination under this category was totally inadequate auscultation represented by listening to a single area of the heart, usually at either the base or the apex. Although most physicians at least made some motion toward examining the heart by auscultation, a few neglected it altogether. On occasion, after attempted auscultation via the open neck of the patient's clothing, the physician explained to the observer that the patient would not be satisfied unless he went through this motion. Although physicians saw no indication for examination of the heart, they were prepared to make this small concession to the patient.

The finer points in the technique of auscultation of the heart which may add immeasurably to the amount of information gained in this fashion were not observed during the course of this study. In an effort to accentuate a faint murmur, one or two physicians had a patient assume various positions during auscultation; however, the exercising of a patient for this purpose was not noted. Not infrequently a physician was heard to comment on an "irregular" cardiac rhythm; however, an attempt to elucidate the cause and exact type of this irregularity was practically never made. Several physicians failed to differentiate murmurs on the basis of their timing in the cardiac cycle. At the other extreme some physicians discovered and identified some very faint diastolic murmurs.

Category 13. Determination of the Blood Pressure (87 physicians)

Systolic measurement only	5%
Apparently careful systolic and diastolic measurement	78%

Careful systolic and diastolic measurements together with examination of peripheral pulses when indicated or blood pressure determination in both arms.....17%

It was felt that if a physician carried out an examination worthy of inclusion in the last category it must indicate knowledge of some anomalies of the cardiovascular system and of the diverse etiology of hypertension. Measurement of the blood pressure is probably the most frequently executed and least understood examination in general practice. After reading some advertisements by life insurance companies and articles in the lay press concerning high blood pressure a patient probably would not feel that he had been examined properly if this measurement was overlooked.

Category 14. Examination of the Abdomen (87 physcians)
No examination or examination with the patient sitting or standing....16%
Examination with the patient lying down but done in perfunctory fashion 60%
Examination with careful palpation of all quadrants, examination for costovertebral tenderness, examination of genitals and palpation of inguinal rings, auscultation when indicated.....24%

Emphasis on the necessity for having the patient in a comfortable, reclining, relaxed position before attempting to examine the abdomen should not be necessary; however, 16 per cent of physicians in this study either failed to instruct the patient to lie down for this examination or else failed to make any examination at all. Lack of appreciation of the relative values of different methods of examining a given organ or region is found in this category also; some physicians routinely listened carefully to peristaltic sounds in the four anatomic quadrants of the abdomen, yet failed to carry out adequate palpation in any quadrant.

Category 15. Neurological Examination (85 physicians)
No neurological examination.....71%
Examination limited to eliciting knee and ankle jerks.....20%
Reflexes tested in all extremities. Other neurological tests performed when indicated—Romberg, Kernig's, Babinski, cranial nerve examination, determination of strength of muscle groups, sensory tests, etc..... 9%

Neurology is a highly specialized branch of medicine and few physicians, save actual specialists, feel very competent in this area. In spite of this, performance of an adequate screening examination for neurological disease should unquestionably be a part of a general physical examination. One might not expect to find a high incidence of isolated intrinsic neurological disease in general practice. However, disease of the vascular tree within the cranium and its attendant neurological sequelae are quite prevalent.

It is noteworthy that a portion of this study was conducted during a mild epidemic of poliomyelitis; even when the question of this disease arose, examination for muscle weakness or reflex changes was apt to be sketchy.

Category 16. Examination of the Extremities (84 physicians)
No examination 64%
Adequate inspection, palpation and testing of motion.....36%

Most often, the extremities were overlooked altogether; next in frequency was squeezing of an ankle in search of edema. Palpation of pulses

was uncommon and a search for calf tenderness or restricted range of motion was rarely seen.

Category 17. Rectal Examination (86 physicians)

Not usually done	83%
Done	17%

Medical students are generally taught to perform digital examination of the rectum on the female to complement the bimanual examination of the pelvis and also to search for disease intrinsic to the rectum. In the next category it will be noted that the pelvic examination was carried out with much higher frequency than the rectal examination. Less than 10 physicians were observed to complete the examination of the vagina and pelvis and then make a digital examination of the rectum on the same patient. A few physicians used the proctoscope in order to complete examination of the rectum and extra credit in Category 20 has been awarded these physicians.

Category 18. Vaginal Examination (84 physicians)

Not usually done	64%
Bimanual examination including visualization of cervix through speculum	21%
Examination performed carefully, thoroughly and including indicated diagnostic measures such as vaginal smears, cytologic smears, biopsies	14%

Here is an example where credit was withheld in evaluation of performance because of failure to make an examination in the presence of indications therefor. One physician had hospitalized a young Negro woman who gave a story of gradual onset of progressive pain in the lower abdomen with fever, chills and leucorrhea. Examination revealed that the patient had fever and marked tenderness over both lower quadrants of the abdomen. Treatment for infection had been instituted but bimanual examination of the pelvis had not been performed. At the other extreme, one physician who practiced very good medicine attempted to do pelvic and rectal examinations routinely on all new patients consulting him for the first time. Occasionally, at the patient's request, he deferred examination until a subsequent visit. In other practices similar comment regarding patients' disapproval of this examination was heard. However, in some instances this implied or expressed disapproval on the part of the patient had been accepted by the physician as adequate reason for not performing the examination on many patients.

Category 19. Examination of the Breasts (78 physicians)

Not routinely examined	86%
Examined as part of the general physical examination	14%

Examination of the breasts of female patients is a simple, rapid procedure which one might expect to be extremely popular in view of the considerable publicity given to breast cancer at the present time. Rather few physicians routinely examined the breasts and only rarely was a patient given instruction in self examination.

Category 20. Special Credit

A few physicians extended the scope of the physical examination beyond

the limits considered minimal for routine screening purposes and carried out additional examinations in some instances. It was felt that these physicians should be given added credit for this level of performance. For instance, if a physician used a proctoscope or exhibited unusual skill or diligence in physical examination, this was noted. Eighty-nine per cent of physicians failed to obtain any extra credit under this category. Nine per cent received credit for a single procedure and one per cent received credit for two special procedures. As can be seen, this category was set up simply as a bonus section to reward physicians who were considered outstanding in their performances of the physical examination. Six physicians used the proctoscope, two physicians received credit for detecting minimal, though significant, diastolic heart murmurs, while one physician received credit for repeated, carefully planned pelvic examinations of his patients during pregnancy.

Use of Laboratory Aids

METHODS OF STUDY

A group of 17 specific items and one miscellaneous category were chosen to form the basis for description of a physician's use of laboratory aids to diagnosis. This group of items comprises some of the simple, readily performed tests on samples of blood and urine as well as other technically more difficult laboratory procedures, including the use of an X-ray machine. The list is not intended to be inclusive nor should it be inferred that the authors recommend this list as a complete battery for use in office diagnosis. Inclusion of a test in this list implies that it is a common, readily performed test of real value; that the need for such a test was frequently encountered; or that experience in the pilot study indicated that such tests are frequently used. Other tests were added in the belief that they would provide criteria for judging a physician's diagnostic ability and discrimination. Each of the 17 specific items was in turn subdivided either once or twice. This convention was adopted to differentiate finer levels of performance of actual test procedures, as well as to provide for an indication of the knowledge and discrimination exhibited by a physician in choosing a particular test or procedure.

After formulation of this outline with its 17 items and their subdivisions, a system of numerical weighting was applied in a fashion similar to that described in previous sections.

Skillful use of laboratory aids to diagnosis involves clinical judgment as well as careful technique in carrying out the procedure. The final profile or sum of the numerical weights of the items in this section signifies the extent of the use of laboratory procedures by a physician as well as his knowledge of when and how to use those tests.

In weighting the descriptive sequences relating to the items in the outline, referral of the patient by the physician to a commercial or hospital laboratory for a certain test procedure was given the same weight as careful performance of the test by the physician in his office. This decision was based upon the belief that referral for laboratory work upon sound indication showed knowledge and discrimination on the part of

the physician and the advantage to the patient was the same, regardless of where the test was performed. During the period of observation, indications for some tests often were not seen and in these circumstances credit was given if the doctor stated that they were usually performed.

In the actual use of this system of descriptive sequences, problems similar to those met in evaluation of the physical examination were encountered. Inconsistency or variability of performance on the part of the physician in question was again a problem. Different interpretations of performance might be made by separate observers. These problems were recognized and dealt with insofar as possible, as recorded in a previous section of this report.

The results of this evaluation both in descriptive terms and in terms of numerical weights follow with illustrative examples. The total number of practices described by each item varies due to lack of available data in some instances. The reasons for this lack have been detailed in a previous section.

RESULTS

Category 1. Urinalysis (88 doctors)
Not done or rarely done.....11%
Frequent examinations for albumin, sugar and sediment.....76%
Carefully collected urine samples with adequate centrifugation, attention given to such items as specific gravity, color, etc., and proper use of reagents, in addition to examination for albumin, sugar and of sediment.....13%

A few doctors rarely examined the urine while others did not examine it with the frequency indicated by the clinical situation. Actual performance of urinalysis was frequently improperly carried out; the commonest error was failure to examine the sediment or failure to centrifuge the specimen to obtain the sediment. The specific gravity of the urine was rarely determined; the pH, hardly ever. Another prevalent deficiency was the failure of the physician to insist on fresh, clean-voided specimens. The erroneous assumption that all white blood cells found in the urine originate in the urinary tract was noted frequently. On this basis, many women were treated for "cystitis," and no attention was paid a leucorrhea which so readily contaminates the specimen unless the bladder is catheterized.

Category 2. Hemoglobin Determinations (86 doctors)
No determination or determination by Tallqvist method only.....26%
Use of Sahli or other simple colorimeter methods.....56%
Skilled use of hemoglobin determination as screening procedure, accurate method such as photoelectric colorimeter or carefully done Sahli method.....18%

The hemoglobin determination has become so commonplace that patients frequently come to the doctor "just to get my hemoglobin checked." Three of the doctors made no hemoglobin determinations during the observer's visit, although such testing seemed eminently appropriate in several instances. Several doctors using the filter-paper method explained that they had checked their results against various other procedures and found them sufficiently close to justify use of the simpler procedure.

Category 3. White Blood Cell Count (85 doctors)

Not done	45%
Done as usual procedure when indicated	55%

Some doctors did not have the equipment for performing this test while others, possessing the requisite apparatus, were not noted to use it. Two doctors made this determination on all patients with upper respiratory infections in an effort to differentiate bacterial from viral infections. However, the routine use of this test or even its employment under specific indications was much less common than the clinical situations required.

Category 4. Blood Smears and Differential Blood Counts (86 doctors)

Not done	48%
Done	52%

Treatment for anemia is common in general practice, and study of erythrocyte morphology should be an integral part of the investigation of anemia; yet this was not the case. Examination of the blood smear and a total leucocyte count are often considered as a unit, and the results of this study suggest that most doctors combine these examinations as a rule.

Category 5. Stool Examination (88 doctors)

Not examined	66%
Examination for parasites, ova or occult blood, or bacteriological culture when indicated	34%

The stool specimen usually obtained at the time of digital examination of the rectum is generally adequate for tests for the presence of occult blood and for microscopic examination. It is interesting to note that the number of physicians who performed some examination of the stool or who had such examination made by someone else (usually state health department) was greater than the number who carried out digital examination of the rectum.

Category 6. Examination of Cerebro-spinal Fluid (62 doctors)

Never done	15%
Done	85%

This item was of particular interest because this study was initiated during an epidemic of poliomyelitis. The results indicate that general practitioners fully appreciate the role of this examination in confirming the diagnosis of this and other diseases affecting the central nervous system. Here again it is interesting to note the wide disparity between the number of physicians who make this examination (85 per cent of those described) and the number who specifically search for signs of neurological disease as part of the physical examination (29 per cent).

Category 7. Red Blood Cell Count (76 doctors)

Not done	53%
Done	47%

The red-cell count was included in this section because of the frequency with which its use in practice was observed during the early part of the study. This procedure with its large inherent error even in experienced hands under standardized conditions probably has little place in a busy practitioner's office, and indeed few physicians actually performed the test without the assistance of trained laboratory personnel. It appears probable

that this test would be used to a greater extent if more physicians carried the investigation of anemia beyond determination of the hemoglobin content of the blood.

Category 8. Bacteriology (88 doctors)

Not done	58%
Gram stained smears of exudate made	33%
Smears done as well as some cultures	9%

The bacteriological work most frequently encountered consisted of examination of stained smears of urethral discharge and tonsillar exudate. Less commonly, doctors obtained cultures of blood, urine, feces or pharyngeal exudate.

Although cultures for identification of offending microorganisms require more elaborate equipment and technical training than can realistically be expected on the part of the busy practitioner, examination of a stained smear of an exudate may yield a great deal of information at the expense of little time or money.

Category 9. Sickling Preparations (59 doctors)

Not done	63%
Done	37%

Although sickle-cell anemia is not a common disease, awareness that its hemolytic crises may mimic other diseases is desirable where there is a large Negro population. The fact that so few doctors make this test is probably just another indication that anemias often are not thoroughly investigated in general practice.

Category 10. X-ray (85 doctors)

No radiographic work performed and patients not referred for these procedures; or improper, careless use including attempts at procedures beyond doctor's skill and training	18%
Does own X-ray studies well or refers patients for studies upon proper indication	82%

Adequate medical care cannot be rendered without recourse to the use of this specialized technique. This is not to imply that every general practitioner must possess and operate his own X-ray machine; doctors were given credit under this category if they referred patients with proper indications to another physician apparently skilled in the use of this technique. Most practitioners who performed their own radiographic work limited it to simpler procedures such as films of the chest or long bones. Two frequently noted shortcomings were examination for bone fractures by fluoroscopy alone and failure to allow time for accommodation for night vision prior to using the fluoroscope. There is clearly great need for more training for physicians using X-ray and fluoroscopic equipment.

Category 11. Blood Chemistry

1. *Determination of blood sugar* (65 doctors)	
Not done	15%
Wilkerson-Heftmann screening test used	7%
Standard test performed	78%
2. *Determination of blood urea nitrogen or blood non-protein nitrogen* (57 doctors)	
Not done	29%
Done	71%

Several doctors whose laboratories were equipped with photoelectric colorimeters could perform these tests in their offices. Most, however, referred patients to the local hospital or commercial clinical laboratory for them. In general, if a doctor did not receive credit for determining the blood sugar, it was because he failed to utilize this test as a guide to the treatment of diabetic patients.

Category 12. Use of Electrocardiograph (EKG) and/or Determination of Basal Metabolic Rate (BMR) (59 doctors)

Not done or not done skillfully or not used when indicated.....48%
Done competently and interpreted correctly, used for patients with indications.....52%

This category was included principally to permit awarding of credit to those physicians who made use of these tools in extending their own diagnostic horizons. Just as in other instances in this section, a physician was given credit for use of these procedures if he performed them well himself or if he referred patients to other physicians or laboratories for testing.

The majority of the observations in this category relate to use of the EKG. Although several doctors owned machines for determining the BMR, they were rarely used and few patients were tested by this technique. In regard to use of the EKG, the two principal shortcomings were failure to obtain tracings in the presence of known or presumptive heart disease and grossly inaccurate interpretation of tracings. Some physicians were satisfied with four-lead tracings; others were unskilled in actual operation of their machines.

Category 13. Serology

1. *Determination of presence of Rh antibodies (Rh typing)* (72 doctors)
Not done.....36%
Done 64%

It was assumed that all hospital laboratories make this determination prior to administration of blood transfusions; so these observations apply to use of the test upon the specific instigation of the physician. The test is readily performed in the physician's office and many did this routinely on the first prenatal visit. Others did not feel the information yielded by the test to be vital and delayed performance of the test until the second or even third uncomplicated pregnancy. A few made this determination only if the patient gave a history of previous complicated pregnancy.

2. *Serological Test for Syphilis* (76 doctors)
Not done or done only for pregnant women.....57%
Done as a general diagnostic procedure.....43%

It is perhaps no longer true that the possibility of syphilis must be entertained in the differential diagnosis of every relatively obscure clinical problem. However, this disease is still no respector of persons, and it continues to appear in unexpected places. The Public Health Laws of the State of North Carolina require performance of a serological test for syphilis before marriage and during the course of antenatal care. The reason for inclusion of the category was to determine the frequency of use of the

test in situations other than those covered by law.

In every case, the blood sample for the test was sent to a state health department laboratory, a hospital, or other clinical laboratories approved for such testing. When the test was used as a general diagnostic measure, this was most apt to be done in the case of neurological or skin disease.

Category 14. Biopsy or Cytologic Smears for Cancer (69 doctors)

Not done	44%
Done	56%

The widespread availability of microscopic diagnosis of biopsy specimens and smears of body secretions and exudates has increased the responsibility of the general practitioner in the early detection of malignant lesions. Actually, however, rather few doctors were noted to secure the necessary specimens in their offices; the majority referred patients to surgeons for biopsies and few used cytological smear techniques.

Category 15. Tuberculin Skin Test (55 doctors)

Never done	46%
Done	54%

Category 16. Special Credit (88 doctors)

No extra laboratory procedures	79%
One extra laboratory procedure	12%
Two extra laboratory procedures	7%
Three or more extra laboratory procedures	2%

TYPE OF PROCEDURE PERFORMED:	No. Drs.
Liver function tests (including BSP, cephalin flocculation, serum proteins and A/G ratio, serum cholesterol, urine urobilinogen)	7
Kidney function tests (including PSP, urine concentration test)	6
Gastric analysis	5
Vital capacity	4
Exercise tolerance with EKG	4
Autopsies	4
Glucose tolerance test	2
Sternal puncture	1
Circulation time	1
Serum amylase	1

As stated previously, the list of laboratory tests utilized in this outline was not designed to be inclusive; it was intended to provide a measure of the general practitioner's use of these aids to diagnosis. As was to be expected, some doctors used additional laboratory tests not listed in the outline. In order to complete the picture of the use of laboratory aids in general practice, recognition had to be given for use of these additional procedures. The category entitled "Special Credit" was devised for this purpose.

Category 17. Sterile Technique (88 doctors)

Showed evidence of breaks in technique, inadequate sterilization of skin or instruments with alcohol or merthiolate, use of unsterilized syringes, needles or stylettes	43%
Adequate boiling (15-30 minutes) or autoclaving of syringes, needles or stylettes	57%

The principal emphasis of this category was on apparent awareness by the physician of the dangers and mode of transmission of homologous serum jaundice. However, other gross breaks in technique were also given consideration. The improper practice of using an unsterile instrument for acupuncture was observed. The same instrument was sometimes used

repeatedly for successive patients, and inadequate sterilization was done between each use. An occasional physician used sterile instruments with unwashed hands while others failed to wash their hands after obvious or presumptive contamination. Nonetheless, the majority of physicians exercised greater care than this.

Therapy

METHODS OF STUDY

The general outline plan utilized for collection of data in previous sections of this report was extended and modified for use in detailing the adjudged value of therapeutic measures employed by individual general practitioners. A list comprising seven categories representing situations or conditions calling for therapeutic measures of varying specificity was compiled. Six of these categories pertain to specific disease states and the seventh pertains to the general use of medications. The six disease categories selected for the purpose of this study were: upper respiratory infection, anemia, obesity, emotional problems, hypertension and congestive heart failure. Inclusion of a particular altered physiological state in this list is of no significance in itself; of the manifold possibilities available, these six were chosen because they are common situations frequently encountered in practice. A diagnosis of these abnormal states is usually not difficult; it was believed that these situations would pose a test for the amount of thought and deliberation employed by a physician in his use of therapeutic measures. In some cases there is room for honest difference of opinion concerning details of treatment; however, there is general agreement on the fundamentals involved.

Information concerning the physician's knowledge of the use of antibiotics was obtained by observing the way he treated upper respiratory infections. His knowledge of psychiatry and supportive techniques was assessed by noting his method of managing the obese and emotionally disturbed patient. Patients with hypertension provided a test of his investigative technique as well as his knowledge of practical therapeutic measures. Sound knowledge of pathologic physiology and of fundamentals of pharmacology are needed for intelligent handling of the patient with congestive heart failure.

Evaluation of a physician's work in terms of the therapeutic measures he employed was predicated largely upon the assumption that a correct diagnosis had been made. Quite obviously intelligent treatment of a sick person is founded upon correct diagnosis and, whenever possible, determination of etiology. There is no treatment for "anemia" for this is not a disease; rational therapy can be instituted only after determination of the cause. Therefore the evaluation of a physician's therapeutic endeavors of necessity also involved some assessment of his diagnostic acumen.

Each of the seven categories in this section was subdivided so as to delineate two or three levels of performance. As detailed previously, a physician's performance was first described qualitatively and then numerical weights were assigned to these descriptive terms. The sum of these weights

provides a single numerical description of the performance observed. Some of the problems involved in the use of this scheme have been related in detail in previous sections.

RESULTS

Category 1. Upper Respiratory Infections (87 physicians)
Antibiotics given indiscriminately to all patients or to most patients....67%
Attempts made to separate viral and bacterial infections for purposes of therapy....33%

The question of which patient with respiratory infection should be treated with antibiotics has not been solved realistically for the practicing physician. Ideally, of course, treatment should be prescribed only after attempts at isolation of the offending organism; unfortunately, lack of facilities often prevents such control. This is one factor which results in the indiscriminate use of antibiotics.

Many physicians did not really understand the values and limitations of these drugs. For instance, the belief that antibiotics are effective in treating the common cold was found to be widespread. Other physicians used these drugs in treating colds on the assumption that they are harmless or might prevent complications. The demand by the patient or his family for a "shot of penicillin" obviously increased the pressure on the physician.

A common finding was the automatic association in the physician's mind between fever or a cold and penicillin. This was manifested by the immediate preparation of an injection of penicillin upon learning that the patient had a fever; this decision was frequently reached before the patient had been examined. Penicillin was the most popular antibiotic used. However, it was often given as a single injection of a soluble preparation with no plan to continue treatment for a realistic period of time.

Some physicians made an effort to differentiate between viral and bacterial respiratory infections. Although these efforts frequently involved the use of imperfect criteria, they were indicative of the physician's knowledge concerning the ineffectiveness of antibiotics against viral infections. The fact that some attempt was made is commendable.

Category 2. Treatment of Anemia (72 physicians)
"Shot-gun' preparations used always....85%
Therapy related to type of anemia....15%

The majority of physicians failed to make a definitive diagnosis in the case of anemia. Low hemoglobin content of the blood was accepted as a disease entity, not as a laboratory finding calling for further investigation. A few physicians demonstrated a firmer grasp of the situation and attempted to elucidate the cause of anemia by making careful blood studies, X-ray examination of the gastro-intestinal tract, measurement of gastric acidity and other tests.

Treatment of anemia was rarely selective and definitive; that most frequently employed was one of several proprietary multivitamin and mineral compounds containing, in addition, various biologic anti-anemia principles. A few physicians indicated a preference for single iron compounds, vitamins alone or blood transfusion. The deluge of advertising

matter undoubtedly influences the physician's choice of therapeutic agents; one pharmaceutical firm advances its product as being curative for all treatable anemias except those due to acute blood loss. This is certainly an attractive proposition to the busy practitioner. Use of these preparations is, of course, helpful in many situations, but it may aggravate others and frequently puts the patient to unnecessary expense.

Category 3. Obesity (76 physicians)
Failure to recognize as a clinical problem, dietary advice inadequate 67%
Recognized as a clinical problem, treated by adequate dietary explanation and support of morale 33%

Treatment of the obese patient is difficult even under the most auspicious circumstances of a high degree of motivation on the part of both physician and patient. It is well recognized that therapeutic efforts at weight reduction must involve strong emotional support as well as dietary control if success is to be achieved. A common finding was that physicians did not recognize obesity as a clinical problem unless the patient mentioned it; even then it might be neglected. Examples were found where patients with diabetes or hypertension specifically asked the doctor about the relationship between these diseases and obesity, only to be assured by the doctor that none existed. Other physicians recognized the problem but failed to provide adequate management. The usual treatment consisted of an appetite-depressant drug and a general admonition to reduce intake of starches and fats. On the other hand, some physicians provided these patients with a lucid explanation of the principles of dieting, a detailed diet list and needed emotional support.

Category 4. Emotional Problems (83 physicians)
Emotional problems not recognized generally and no treatment or unskilled treatment administered 29%
Emotional problems recognized but treatment not undertaken or not skillful or given for somatic complaints only 54%
Emotional problems recognized and treated with sufficient competence to demonstrate grasp of treatment methods 17%

Emotional problems appear to constitute an enigma for the practicing physician; many physicians completely failed to recognize these problems in their practices. Others, while recognizing the problems, were either indifferent to them or appeared to be made uncomfortable by patients with such problems. References to malingering, hypochondriacs, "problem patients" or "getting them out of the office quickly" were frequently heard, all indicating that some physicians were not prepared to deal sympathetically with these patients.

In actual practice, management of such patients usually involved an extended search for organic disease or repeated prescriptions for a variety of drugs, principally vitamins, iron preparations, antacids, sex hormones and antispasmodics. A few doctors recognized emotional problems and referred the patients. Many more physicians expressed a willingness to refer more patients if psychiatric care for the mildly maladjusted patient were more generally available. A rather small number of physicians appeared to be making an attempt to help these patients by affording opportunity for ventilation through repeated visits and interviews.

Symptomatic medical therapy employing drugs and treatments may have value in this regard. Certainly it appeared that many patients with vague symptoms probably resulting from emotional maladjustment felt better and were satisfied by the physician's care; repeated visits with protestations of good-will and without antagonism are interpreted as satisfaction with the doctor's efforts. Quite a few physicians recognized the relationship between stressful situations and patients' symptoms, but stated that their formal training had not prepared them to cope with these problems. Probably, the sympathetic physician provides more emotional support than he realizes.

Dr. R. W. Howell, Professor of Mental Health, School of Public Health, University of North Carolina, who visited a variety of practices, stated the following with respect to emotional disease: "History taking was poor . . . but probing into possible emotional factors made up a large portion of the professionally oriented conversation between doctor and patient.

"The desirable response in the great majority of patients seems a result which can best be explained by the value of the supporting effects of the doctor-patient relationship. Generally, the patients were very satisfied with their doctor and praised him openly." He further noted the lack of technical preparation for dealing with emotional problems among most of these physicians. As an example, he stated that the common practice of treating pregnancy as a somewhat humorous situation might well increase a mother's difficulties in adjusting to an unplanned and sometimes unwanted pregnancy.

Category 5. Hypertension (82 physicians)

Assessment of hypertensive disease poor or limited to blood pressure determination only. Management not skilled, neglect of simple therapeutic procedures such as weight reduction, rest and salt restriction. Drugs poorly selected or administration unskilled....57%

Treatment of hypertension included assessment of arterial disease as evidenced by adequate examination of eye grounds, urine, blood pressure, heart and search for edema. Management included weight reduction, care in selection and supervision of treatment (sedatives, anti-hypertensive drugs, low salt diet, rest and reassurance).....43%

The analogy between hypertension and anemia has been drawn previously; both are findings which may be produced by many diverse causes, but the analogy does not end there. Just as most general practitioners treated anemia as a disease, they also failed to give consideration to the etiology of hypertension. The concept of hypertension as a generalized disease was not much in evidence. Also, little or no effort was made to determine if the patient had a sustained or transient elevation of blood pressure. The diagnosis of hypertension was usually made solely on the basis of finding an elevated pressure reading, frequently in one arm and of low magnitude.

Treatment usually consisted of a single antihypertensive drug. Little attention was paid to ancillary measures such as weight reduction and restriction of sodium intake. This seemed to indicate lack of understanding of the problem of hypertensive vascular disease as a whole. Physicians employing the newer antihypertensive drugs frequently did not exhibit a thorough knowledge of the values, limitations and proper methods of administration of these drugs. For instance, if the patient failed to respond with a lowering of blood pressure to a drug given in one dosage form, the physician usually changed to another drug rather than adjusting the dose of the original preparation or adding another in combination. Quite

a few physicians confined their treatment of hypertension to prescription of proprietary compounds usually containing vitamins, a mild sedative and a mild spasmolytic agent. The basic defect in treatment resolved itself into a lack of understanding of the problem as a whole and of the methods effective in combating the problem.

Category 6. Congestive Heart Failure (44 physicians)
Digitalis, quinidine, mercurials not used with proper indications, salt restriction not accompanied by adequate dietary explanation, management not skilled, no attention to weight reduction.....39%
Intermediate skill.....36%
Skilled used of digitalis in adequate amounts, skilled use of mercurial diuretics, quinidine, use of low salt diet with adequate explanation thereof, management good.....25%

A few doctors gave evidence that they possessed the knowledge and skills necessary for successful management of the patient with congestive heart failure. Inability to make the correct diagnosis or lack of concerted effort to determine the causative factors producing congestive heart failure were again in evidence. It was previously noted that many physicians made no effort to describe heart murmurs in terms of their timing, intensity, or probable causation. Irregularities in cardiac rhythm were treated similarly. The justly outmoded terms "myocarditis" and "fat around the heart" were still heard.

Several physicians in treating heart failure appeared to place too much reliance on digitalis alone without individualizing the dose of this drug to fit the patient's needs and without giving sufficient thought and emphasis to other measures. Small doses of tincture of digitalis were occasionally prescribed as a "tonic" for "weak heart" or for the dyspneic patient. The values and limitations of the mercurial diuretics and the role of sodium restriction were poorly understood.

Other physicians demonstrated an adequate grasp of the fundamentals of cardiac therapy. They individualized the dosage of drugs and understood the principle of potentiating one drug with another. They also utilized the patient's weight, determination of circulation time and respiratory vital capacity as aids to diagnosis and management.

Patients with congestive heart failure were not found in great abundance in the practices visited. It can hardly be denied that practice and experience are necessary to the development of skill in routine handling of such patients; this may contribute to the inadequacy of the management exhibited by some physicians.

Category 7. Careful Use of Potentially Dangerous Medications (67 physicians)
Doctor made no effort to avoid drug reactions or complications.....46%
Doctor showed awareness of possible toxicity from a medication. He inquired about previous penicillin injections and reactions. He provided proper supervision and advice to patients receiving drugs such as Butazolidin, propylthiouracil, ACTH or cortisone.....54%

The increased number of potent and relatively specific medications available today has placed an increased responsibility upon the physician to make a correct diagnosis so that these drugs may be employed in the most efficacious manner. The use of a potentially dangerous medication

is justified only in the face of a grave clinical situation involving greater threat to life than does the medication. The use of such drugs obviously depends upon making the correct diagnosis; otherwise, their use in the absence of clear-cut need is indefensible.

Most physicians demonstrated awareness of the contraindications and of the toxic manifestations of the majority of drugs which they used commonly. Use of the adrenal steroid hormones was not widespread, and several doctors expressed the belief that the dangers of toxicity outweighed their clinical value. The indiscriminate use of antibiotics has been described previously; most physicians appeared to be aware of possible toxic reactions. Phenylbutazone was used sparingly with apparently full realization of its potential toxicity.

Use of tetanus antitoxin without prior testing for sensitivity was encountered. Sex hormones were sometimes used too freely. The impression was gained that narcotics were used more freely than necessary, but this could not be documented. As noted previously, blood transfusions were occasionally used without clear-cut evidence of need.

Preventive Medicine

METHODS OF STUDY

Many possible items upon which evaluation of a physician's work in preventive medicine might be based suggested themselves but were discarded for a number of reasons. For instance, the care of the diabetic patient presents almost unlimited scope for a physician's efforts in forestalling the degenerative complications which are part and parcel of this disease. However, experience in the pilot study and in the early part of the present study gave indication that diabetes does not form a very large segment of the morbidity encountered in general practice. The annual physical examination of the symptomless patient provides another area for intensive efforts at preventive medicine. Again, early experience indicated that this practice is rarely carried out. Eventually it was decided that observation of a physician's routines for antenatal and well-child care, while not inclusive, would serve quite well for the purposes at hand. This decision was based largely on the high incidence of obstetric and pediatric care which had been observed in general practice. Also, there were authoritative, accepted standards to serve as a guide for this evaluation. It was believed that the majority of physicians had been thoroughly exposed to the principles of antenatal and well-child care during medical school and subsequent internship.

RESULTS

Category 1. Antenatal Care
a. *Initial antenatal visit* (71 physicians)
Performance of physical examination including examination of eye grounds, careful pelvic examination with attention to internal measurements, determination of Rh type, STS and hemoglobin level with omission of no more than one procedure.....38%
Omission of not over 2 procedures.....35%
Omission of 3 or more procedures.....27%

b. *Subsequent antenatal visits* (71 physicians)
At each visit weight and urine were examined and the uterus palpated and later in pregnancy auscultation of the fetal heart was carried out 66%
Omission of any one of the above procedures..... 34%

c. *Schedule of antenatal visits* (72 physicians)
The doctor had a schedule of prenatal visits including a post-partum visit approximating that recommended by the American Committee on Maternal Welfare[1,2] and the doctor made an effort to convince the patient of the necessity for such visits..... 87%
The doctor had no schedule of prenatal visits, omitted post-partum exams, made no effort to have the patient make prenatal visits regularly or attend for post-partum check..... 13%

No effort was made to evaluate a physician's performance in regard to the actual mechanical skills of obstetrics because that is not, strictly speaking, within the purview of preventive medicine. In addition, the physician-observers were internists relatively untrained in obstetrical manipulations.

Under the section headed "initial antenatal visit" which calls for a rather complete examination on the patient's first visit to the physician, credit was actually given if the physician carried out these examinations either at the initial visit or within a reasonable period of time thereafter. Some physicians thought that parts of the examination were better left for subsequent visits after the doctor-patient relationship had developed more fully. The commonest shortcoming was failure to perform a complete physical examination; very few doctors routinely examined the ocular fundi. A few physicians performed bimanual pelvic examination only on primiparous patients or on patients who had experienced difficult delivery in the past. Most physicians determined the Rh blood type, but a very few did not even measure the hemoglobin content of the blood.

A great diversity of performance was noted with regard to subsequent antenatal visits. Some physicians manifested a real concern for the welfare of their obstetrical patients and repeated careful physical examinations and laboratory tests. On the other hand there were 16 doctors who neglected palpation of the uterus and auscultation of the fetal heart sounds during routine prenatal visits. Two physicians had delegated supervision of routine prenatal visits to office nurses, and the doctor saw the patient only if she had specific complaints.

In most cases the schedule of antenatal visits adhered to by the physician came up to acceptable standards. However, a few continued the monthly visits acceptable in the early months of gestation right up to the time of delivery without increasing the frequency of visits. On the other hand, some doctors requested their patients to come in every two weeks throughout pregnancy. The majority scheduled longer intervals during the early part of pregnancy with visits becoming more frequent as term approached.

Category 2. Well-child Care (77 physicians)
Superior preventive care included schedule of well-child examinations and immunizations, education of the parents, employment of special tests such as STS, tuberculin skin test when indicated..... 19%

1. *Maternal Care*, p. 12, University of Chicago Press, Chicago, Ill. (1937)
2. *Standards of Prenatal Care*, U. S. Dept. of Labor, Children's Bureau Publication 153, Washington, D. C. (1940)

Care included a schedule of immunization, attempts to get children immunized, preventive work limited to immunization.....74%
No effort made to educate parents as to the need for immunization..... 7%

There is no hard and fast agreement on the actual frequency with which a normal, healthy baby should be examined during the early period of its life. However, there is no argument that periodic visits for general examination, immunization and parent counseling should be encouraged during infancy and early childhood. Some physicians in this study stated that schedules for well-baby care were unnecessary because the parents would always bring the child in to see the doctor if things were not going well. Most physicians, however, were not quite so composed about this matter and urged parents to return with the babies at specific intervals so that initial immunizations could be performed. A few physicians continued the schedule of well-child visits through the age of two years.

Clinical Records

METHODS OF STUDY

The recording of clinical data pertinent to each patient's illness is regarded by some physicians as a necessary nuisance while others tend this aspect of medical practice with loving care. On the assumption that the maintenance of clinical records is an integral part of medical practice it was considered justifiable to include the evaluation of a physician's record system as part of the description of his practice. It was realized that the extent of a physician's clinical records might not necessarily be a valid predictor of his professional skill. Nevertheless, this should provide some indication of the physician's thoroughness and attention to details which add up to good patient care.

RESULTS (87 physicians)

Only information concerning medications, fees or isolated data such as blood pressure recorded.....36%
Minimal information about positive findings and medications recorded..47%
Very good records including all positive items of history and physical examination with results of laboratory work including blood pressure, urine and weight, medications or other treatment. Special files on OB, pediatrics or other patients with well filled check sheets tended to place a doctor in this group. Records included hospital visits 17%

Earlier in this report allusion was made to the fallibility of the human memory and the improbability that a physician can carry in his mind all the significant details pertinent to a given illness in a given patient. Obviously records of some sort are necessary. The record systems employed and the amount of information recorded by the physicians showed a wide range of variation. Eleven physicians maintained no clinical records at all; in these practices the patient's name and the fee charged for the visit were noted in a daily ledger. Some kept records only for "regular" patients or obstetrical patients, while a few physicians maintained complete patient records of each visit, whether in the home, the hospital or in the office, and they incorporated into this record written reports from consultants or medical centers.

The actual form of the record sheet that was utilized varied from the

very elaborate to a plain sheet of paper or card. Many physicians used a variety of outline forms such as those prepared by professional stationers. Most employed some type of small card or printed form although prescription blanks and laboratory report blanks were used by a few.

The amount of information recorded varied as widely as did the form on which the notations were made.

The evolution of the record system in one doctor's practice typifies what may have happened in other practices. In the early days of his practice this physician attempted to write complete patient records as he had been taught to do in medical school and internship. However, as the size of his practice increased and the demands on his time became greater, this laborious method of keeping records became impractical so he changed to the use of a printed outline or check list. This, too, became too much. Finally, the doctor had settled on the use of a small filing card on which he recorded the patient's identifying data, a few pertinent remarks and physical findings, plus the treatment rendered. This story probably represents a realistic summary of the problem encountered by many physicians.

DISCUSSION

The remarkable variation in the performance of general practitioners has been noted and attempts made to measure it. This difference in performance is particularly striking because of the similarity of educational background of these physicians.

A few broad general points can now be identified. The practice which was above average in quality was characterized first of all by evidence of knowledge of clinical medicine. The physician providing a higher grade of medical care showed a real interest in his patients and their medical problems. These provided for him an intellectual challenge. The better doctor also demonstrated an awareness of and a willingness to accept the responsibilities inherent in undertaking the care of a patient. At the opposite extreme, physicians operated on such a superficial plane as to give the appearance of a lack of preparation for assuming these responsibilities.

The principal criticism to be offered of the physicians whose performance appeared to be at the other end of the scale was that they apparently lacked fundamental clinical medical knowledge and skill. This was graphically illustrated by limited history taking, physical examination and use of laboratory aids to diagnosis. This performance level is undoubtedly related to many extrinsic factors, some of which have been identified and measured during the course of this study.

The practice of medicine is a complex business requiring a great deal more than mere knowledge of disease. Factual knowledge is fundamental, but it must be tempered with judgment and leavened with interest to produce a good doctor. It appeared that some physicians were not challenged by the practice of medicine. In several instances the observers had the impression that the physician was not performing at a level commensurate with his basic knowledge. These physicians had learned the neces-

sary facts but for some reason would not or could not utilize this knowledge in a purposeful and rewarding fashion. They appeared to lack zest for the practice of medicine which had become a chore for them. Dr. R. W. Howell concurred in this judgment and noted that the less adept physicians appeared to be unhappy in the practice of medicine and generally lacked interest in their patients as people.

Press of time is a complaint frequently voiced by the general practitioner. Time alone is not the sole determinant of the quality of care rendered in a practice. Some of the very best doctors had hurried practices, while others had smaller practices which could be conducted in a much more leisurely fashion. The same applies to some of the less adept physicians; so that size of practice and press of time do not correlate well with the quality of care rendered.

Another popularly held belief is that the small town or rural practitioner cannot practice good medicine because facilities are not available to him. A physician presumably enters practice with all that is required for taking a good history and performing a careful physical examination; the amount of equipment necessary for the performance of a few simple laboratory screening tests is not great. These form the basis of good medical practice and the basis for evaluation in this study.

It is difficult to assess the importance of aging in relation to the quality of medical care rendered by physicians since physical and intellectual activities decline at a variable rate with advancing years. Years of strenuous practice, less economic pressure, ill health and development of interests outside of medicine may all play a part in the poorer work observed among older physicians. Quite naturally, the philosophy with which each physician approached increasing age varied; several refused to limit their work because of age or health and continued their previous high level of practice.

In this discussion, the variations in the individual physician's motives and interests have been stressed. That they are of importance will be evident throughout this report. Future research should be aimed at their recognition and evaluation. In the following pages measurable factors that influence the physician's performance will be examined at length.

IV: Education and Training

A. Medical Education

THAT ACADEMIC PERFORMANCE is a predictor of professional performance is an assertion that is likely to provoke spirited debate. This belief has been fostered, at least in part, by the fact that an outstanding academic record at the undergraduate level is frequently duplicated in graduate or professional school. Medical educators are generally aware that there is an imperfect correlation between academic success and later performance in practice. A few, indeed, remark on the inexactness of grades as indicators of a student's ability. The view that academic excellence and practical performance tend to be mutually exclusive characteristics is also widely held. Nevertheless, the college record is accorded important consideration in selecting candidates for medical school, as is the student's record in medical school in subsequent selection for internship. Since the intellectual and personality characteristics that make for superior performance in the practice of medicine are not known, grades, the most tangible measure at hand, are relied upon heavily.

Every year medical school admissions committees must sift through thousands of applications for admission and they must base their decisions on individual differences that sometimes seem meager in the extreme. In addition to impressions gained through personal interviews, letters of recommendation and college grades, the admissions committee may be aided by the Medical College Aptitude Test. As a predictor of success in medical school, this test has apparently proven to be of variable help to different medical schools. Despite any help it may give in selecting students capable of successfully completing the medical school curriculum, no claim is made that it is a "medical aptitude test" in the sense that it can predict performance as a physician. Most medical schools are confronted by more applicants than can be accepted, so a reliable basis for selection of good physicians, as well as good medical students, is a matter of both theoretical and practical importance. This study provided a unique opportunity for retrospective study of the relation between academic performance and professional performance.

METHODS OF STUDY

Information concerning each physician's academic performance was obtained by means of a printed questionnaire which was sent to the dean of each of the medical schools from which these 94 physicians were graduated. The dean was requested to supply data concerning the physician's undergraduate academic record, his relative class standing in medical school,

score on the Medical College Aptitude Test, and his internship appointment. Comments concerning factors which might have affected, adversely or otherwise, the physician's performance while in medical school were invited.

In an effort to test the validity of this sample in regard to performance in medical school, a control sample of 46 general practitioners was drawn. Thus, questionnaires were sent out requesting information on more physicians than were in the sample studied. This device served to maintain the anonymity of the physicians in the active sample since the medical schools were not informed whether the physicians on whom information was sought were or were not in the study; this was another purpose of including the control sample.

Information obtained from deans of the various medical schools was sufficient in 89 instances in the study group to allow for determination of the relative class standing of the physician. All questionnaires were returned but the information provided by some did not permit determination of the physician's relative class standing. In two cases the schools were unable to supply the information requested; and the information available concerning three other men could not be used to establish a definite relative class rank. The use of relative rank or percentile rank is a convenient and widely used method for denoting the academic standing of a student in relation to others in the same class. Since an accurate rank could be derived for many physicians it seemed justifiable to attempt to do so for all. In 36 instances the exact rank of the physician in his class was reported by his dean. In other cases, it was known only that the physician stood in a specific third or quarter of his class. A man standing in a given third or quarter of his class was assigned a percentile rank midway between the limits of that third. For instance, a man who was reported as standing in the lower third of the class was assigned a percentile rank of 17. Similarly, men standing in the middle and upper thirds were assigned mid-point ranks of 50 and 83, respectively. This assignment of a percentile rank was necessary in 50 instances. In the case of three other physicians, a percentile rank was calculated from the grades as reported by the deans of their schools.

One obvious difficulty in using such a technique as this arises from the fact that some schools, in dividing their classes into thirds on the basis of academic standing, may do so on a strictly arithmetic basis while others employ the division of "academic thirds." Under this system one group of students, perhaps less than an actual arithmetic third of the class, is outstandingly good and is characterized as the upper third, while another group, perhaps of greater or lesser size, is poor and is characterized as the lower third. This leaves a group numerically greater than one third of the total to constitute the undifferentiated middle third of the class. In most instances it was not known which of these two systems the medical schools in question had followed.

There is no method available which will allow for exact comparisons between physicians within this group on the basis of academic grades. Grading varies so greatly from one school to another that the "A," "B," "C" conventions of one school have little meaning to another. Doctors X and Y

who were in the same decile of their class but in different medical schools were not necessarily students of similar ability and performance. However, it is likely that the percentile rank derived by comparing the performance of one student with that of all the other members of his class is the most informative measure available of that student's academic achievement.

RESULTS

Undergraduate education

The variety of responses obtained in answer to the request for undergraduate college grades did not permit meaningful tabulation of these figures. In the case of some of the older doctors, there were no such grades because students were admitted to medical school directly from high school. In many other instances, college grades were simply not known by the dean of the school or, if the student had attended more than one college, only a portion of his college record was available. Few colleges attempt to establish a rank order for their students as do medical schools. The many different numerals or letter-grades used in different institutions prevent direct comparisons. An additional complicating factor is the wide diversity of educational opportunity offered by various junior colleges and colleges. A grade of "A" awarded by a great established university probably cannot be equated with an "A" from a local day college. The relationship between performance as an undergraduate and as a practicing physician is obviously of great importance and it is intended to pursue this subject further.

Medical school rank of general practitioners

Although the physicians cooperating in this study were selected without regard to their performance in medical school, compilation of their academic records indicates that a fairly representative sample was obtained. Nineteen physicians (21 per cent) stood in the upper third of their class in medical school, 42 physicians (47 per cent) stood in the middle third, while 28 physicians (31 per cent) stood in the lower third of the class. Of the 46 physicians in the control sample, seven (16 per cent) were in the upper third of their class in medical school; 22 (52 per cent), in the middle; and 14 (32 per cent) in the lower third. Information on three physicians in the control sample was insufficient to allow determination of their class standing. The two samples are comparable in regard to class rank in medical school and this shows that the sample studied was not weighted with doctors from the lower academic stratum.

The distribution of these physicians on the basis of their grades in medical school approximates that which would be derived if a class in any medical school were divided into "academic thirds." The small number in the upper third of the class in the present study may indicate that some men who stood in the upper third of their class in medical school did not enter general practice but rather chose a career in teaching, investigation or a specialty practice. This hypothesis cannot be proven, but it is generally assumed that students in the upper portion of the class are more apt to be chosen on a competitive basis for advanced training leading to specialization

and academic positions. This does not imply that only poor students are forced into general practice as a last resort; patently this is not the case.

Academic difficulties

According to the information received on the questionnaire, nine men experienced serious academic difficulty at one or more times during their careers in medical school. Most of these students were compelled to repeat at least one course or even a whole year or more of the curriculum. Two were dropped from medical school because of poor academic attainment but were subsequently admitted to other schools where they were successful in obtaining their degrees. On the other hand, some stood well within the upper 10 per cent of their class. Therefore, it appears valid to conclude that this group of physicians represents all levels of academic achievement.

Medical schools represented

Of the medical schools represented by physicians in this study, 20 are privately supported institutions while 12 are supported by public funds. These schools represent most sections of the country, including 18 states and the District of Columbia. However, the majority of physicians were graduated from schools located on the eastern seaboard. The list of schools comprises acknowledged leaders in medical education as well as less well known institutions with principally local influence. The numerical predominance of graduates of a few schools may be explained on the basis of geographical proximity to the state of North Carolina, the orientation of some schools toward training for general practice, and the facilities of some schools for enlarging their graduating classes by admitting additional students to the third-year class from the two-year basic science schools elsewhere. Some physicians in this study received their first two years of professional education in one of the two-year basic science schools in North Carolina. Although these two schools have now been expanded to offer the full four-year curriculum, for many years they operated as two-year schools, and their alumni comprise an important segment of the physicians currently practicing in the state.

Division of medical schools

Present-day medical schools in this country are all very good and present almost identical curricula; the fact that the school in which the doctor was educated seems to have little, if any, discernible influence on his subsequent performance in practice lends added validity to this method of comparison on the basis of class standing. The 32 schools represented were divided into two groups. Into one group fell the schools widely known for their output in terms of teachers, scientific investigators and significant research, while the other group comprised the schools where major emphasis is placed on practice, either in terms of general medicine or a specialty. Comparison of the quality of medical care provided by the physicians in this study revealed no differences on the basis of the schools from which they were graduated.

It should be emphasized that the above conclusions apply only to general practitioners and possibly only to the area studied. In the case of

TABLE 2

Comparison of Physicians by Medical School Rank and Qualitative Rank

Percentile Rank in Medical School	Total	Qualitative Rank V	IV	III	II	I	Mean Qualitative Rank
71-100	18	4	4	5	3	2	3.2
31- 70	40	2	6	11	15	6	2.5
0- 30	26	1	5	8	4	8	2.5

some schools a large percentage of graduates remain in medical education or enter specialist practice. It is possible that general practitioners graduating from such schools are not representative of their school's graduates. The findings presented here must be considered with such a possible bias in mind.

Academic influence on quality of practice

Of paramount interest is the relationship between a physician's academic performance and his subsequent performance in practice; this is shown in Table 2. In this table the mean qualitative rank was calculated by weighting each qualitative rank (I through V) with the corresponding number. Information as to academic achievement was available for only 84 of the 88 physicians whose practices were ranked.

Clearly there is a slight, though significant relationship between high academic grades and quality of practice. Physicians whose academic performance placed them in the upper portion of their class were, on the average, better doctors than their colleagues in the middle and lower class echelons (p = less than 5 per cent). However, the difference is not striking, and the range of performance even among the top group of students was wide.

In an effort to identify the factors producing the trend noted in this comparison, the group was broken down on the basis of age. Those results show clearly the positive association between academic standing and per-

TABLE 3

Comparison of Academic Rank with Quality of Practice in Different Age Groups

Medical School Rank	Age Group 28-35 No.	28-35 Mean Qualitative Rank*	36-45 No.	36-45 Mean Qualitative Rank**	46-65 No.	46-65 Mean Qualitative Rank**
Upper Third	5	4.2	9	3.0	4	2.8
Middle Third	14	3.3	11	2.5	15	2.0
Lower Third	6	1.5	7	3.7	13	2.3

* Differences statistically significant (p = less than 1%)

** Differences not statistically significant

formance in practice for physicians in the youngest age group (28-35 years). The linear trend is statistically significant (p = less than 1 per cent). With regard to older physicians, this correlation is not found. The exact age at which this association disappears is not known. The numbers involved are too small to permit a more precise statement than that it is no longer identifiable, for the group, after the age of 35. Since this was not a longitudinal study, the reason for the absence of this association in the higher age group cannot be stated categorically. It seems most probable that with aging and experience the performance of all doctors tends toward a mean. However, it cannot be denied that other factors such as different standards of selection of medical students or different standards of education may be involved.

Comparisons were also made of academic performance and performance in the six specific areas upon which judgment as to the quality of a physician's performance was based. These included history taking, physical examination, use of laboratory aids, therapy, clinical records and preventive medicine. This analysis was attempted in an effort to determine if academic performance had a more significant or pronounced effect on any one area of a physician's practice. It should be noted that the quantitative score is used for this comparison in Table 4.

A linear relationship between academic and professional performance was obtained with respect to these six areas for the younger physicians only; again, the effect disappears after the age of 35. The individual differences noted in Table 4 do not reach the level of statistical significance, but because of the linear trend and the constant relationship, it would seem reasonable to infer that these various facets of a physician's work reflect the influence of academic achievement. (Even though individual items do not show significant linear regression for the group under age 35, the chance that all

TABLE 4

Academic Rank and Performance in Specific Clinical Areas* for Different Age Groups

	28 - 35			36 - 45			46 - 65		
	Upper Third	Middle Third	Lower Third	Upper Third	Middle Third	Lower Third	Upper Third	Middle Third	Lower Third
No of Physicians	5	14	6	9	11	7	4	15	13
Clinical History	55	38	22	32	19	54	29	26	26
Physical Examination..	55	40	22	29	32	48	29	22	29
Use of Laboratory Aids	60	46	33	65	48	65	45	40	36
Therapy	64	33	18	42	29	64	27	33	31
Preventive Medicine	85	71	60	63	60	74	50	52	55
Clinical Records	60	52	33	42	41	79	50	27	21

* All figures are in terms of percentage of possible points on the quantitative grading system.

would vary in the same direction six times is less than one in 4,000 by the sign test.) Thus it appears that, on the average, the better medical student performs at a higher level for a few years after entering practice but that this effect disappears at around the age of 35. It should be noted that there is over-lapping between groups and that the figures presented are based on averages.

Other relationships

As noted earlier, medical educators are not in agreement concerning the predictive value of the Medical College Aptitude Test score. Some report a high degree of correlation between the score and subsequent academic performance while others find no significant agreement. Test scores were available for only 30 of the physicians cooperating in this study. There was no demonstrable relationship between the scores and subsequent grades in medical school, nor was there a significant relationship between the test score and the physician's subsequent performance in practice. The numbers involved in these calculations were quite small; larger numbers might conceivably demonstrate a relationship not revealed here.

There was no significant relationship between the physician's grades as a student in medical school and his father's occupation or the population of the town where the physician grew up. It was thought that these factors might possibly have some bearing on the student's ability as reflected in medical class standing; however, the findings were not statistically significant.

Criticism of curriculum

During the course of this study an attempt was made to learn if the practitioners were satisfied with their medical education. They were asked whether they felt anything necessary had been omitted from the curriculum or if anything had been taught in excess. In the case of the former question, most of the physicians stated that more clinical training was desirable. Specific recommendations dealing with need for more psychiatry, electrocardiography, general medicine, dermatology or obstetrics were made as well as general criticisms dealing with inadequate clinical experience. Many of the older physicians realized that they had had clinical experience in much smaller amounts than is regarded as adequate at the present time.

Only about a third of the doctors felt that anything could have been omitted from the medical curriculum, and almost all of these criticisms were directed towards the basic sciences. The physicians who made these comments represented all differing levels of performance. Biochemistry was frequently mentioned as a subject that was not necessary for general practice. Detailed anatomy, the extensive laboratory work in physiology, pharmacology and pathology were also occasionally mentioned. It is thus seen that most general practitioners felt they should have had more clinical experience while a minority appeared to feel that economies could be effected in the time spent studying basic sciences.

B. Internship and Residency Training

Though the internship is not a venerable institution, it has become almost universally accepted as a customary part of the young physician's training. Some medical schools require completion of a satisfactory internship prior to awarding the M.D. degree, and completion of an internship is a frequent requirement for a license to practice medicine. The physician's hospital training is the only portion of his whole medical education that is characteristically flexible and over which he has a real measure of control.

Weiskotten found that a single year of internship was served by approximately two-thirds of the general practitioners graduating in the years 1930, 1935 and 1940.[1, 2] The one-year rotating internship, which makes up over 70 per cent of the internships in this country, has enjoyed popular acceptance as a standard preparation for general practice.[3, 4] In addition, examining boards in 14 states and two territories require a one-year rotating internship before licensure.[5]

Many medical educators as well as others maintain that at least a two-year training period is a necessary preparation for general practice.[6, 7, 8] Since its founding in June 1947, The American Academy of General Practice has advocated two years of hospital training for general practice. Its recommendations include a year of rotating internship followed by a second year of residency.[9, 10] In view of the many opinions and controversies about training, particular attention has been paid to type and length of training as they affect the doctor's work. It has also been used as a rough test of the extent to which North Carolina practitioners resemble practitioners generally in the United States.

METHODS OF STUDY

Information was obtained from the cooperating physicians as to the duration and location of intern and residency training received, as well as the amount of time spent on individual services. In some few cases this was supplemented by information supplied by the medical school. In an attempt to evaluate the training of each physician the American Medical Association's hospital classification was used. The individual hospitals were classi-

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2. Weiskotten, H. G. and Altenderfer, M. E.: "Trends in Medical Practice," *J. Med. Edu., 27:* 36 (September 1952)
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10. "A Report on General Practice Residencies," *GP 8:* 155-157, (September 1953)

fied for the year or years during which the physician was in training. The classification follows:

A. Major teaching hospital.
B. Minor teaching hospital.
C. Minor teaching hospital accredited for internship only (i.e., not accredited for residency).
D. Nonteaching hospital accredited for internship and residency in special services.
E. Nonteaching hospital accredited for internship and one-year "general" or "mixed" residency only.
F. Nonteaching hospital accredited for internship only.
G. Nonteaching hospital accredited for residency only.
H. Not accredited for internship or residency.

In view of the great variation in the length and even greater variation in quality and type of hospital training which was encountered, a scoring system was devised to provide for comparisons based on the length and type of hospital in which training was taken. Points were awarded for each month of hospital training as follows:

4 points were awarded for each month spent in a major teaching hospital.
3 points were awarded for each month spent in a minor teaching hospital.
2 points were awarded for each month in a nonteaching hospital approved for internship training.
1 point was awarded for each month spent in a hospital of over 100 beds but not approved for internship training.
½ point was awarded for each month spent in a non-approved hospital with less than 100 beds.

This weighting allowed the quality of intern and residency training to be dealt with quantitatively. The product of the months of training and the weights shown above gave a "training score" that embodied both length and quality. Where training was obtained in several hospitals the sums of the products of each period were, of course, determined to obtain the total.

The weights assigned were of necessity arbitrary. Although the weights assigned to training in the various types of hospitals are thought to correspond roughly to their individual values, their main purpose is to provide a numerical expression related principally to the hospital classification rather than the length of training. Small weights were assigned to hospitals not approved for internship principally to distinguish doctors with some training from those with none. The nonapproved hospitals were further separated on a size basis since those with more than 100 beds may have extensive facilities and considerable clinical material. The nonapproved hospitals of less than 100 beds would not seem to have the necessary minima to recommend them for training purposes. One hospital in this group, for example, had 35 beds.

In most of the following discussions internship and residency are lumped as "training." As the training scores rose, residency training was increasingly involved so additional weighting for residency would have increased the spread of the scores but not their accuracy. In several instances it was not possible to determine whether training was internship or residency. Approximate equivalents of the various intervals of training score as used hereafter are given below:

0–20 less than one year approved internship.
21–28 one year approved internship.
29–40 one and one-half years approved internship or one year of minor teaching hospital internship.

41–60 one year teaching hospital internship or two years in approved hospital.
61–192 one to four years teaching hospital training.

Most of the training experiences fitted the example given. Combinations of experience in hospitals of several classifications or especially long training produced occasional divergences from these approximations.

In the following discussion the terms "length of training," "type of training," and "quality of training" will be employed. *Length of training* is used to include the total time spent in internship and residency as discussed above. *Type of training* refers to rotating, mixed, or straight services. *Quality of training* refers to the classification of the hospital (i.e., teaching, nonteaching, or nonapproved) as discussed above.

RESULTS

Length of training

The length of hospital training served by the 94 general practitioners visited in this study varied from 0 to 60 months. A bimodal curve is formed with humps at 12 and 24 months, reflecting the fact that appointments are usually made in increments of 12 months.

Three physicians had made no attempt to secure an internship and had gone straight from medical school into practice. A fourth had spent a year helping a general practitioner in a small town, both working in his office and assisting in the operation of a private hospital "on the side." This was not treated as an internship in the following calculations, although it might well have been reported as such in some of the studies with which comparisons will be made. Another physician served six months of a twelve-month rotating internship appointment and resigned upon discovering that the second six months was to consist of a repetition of the services which he had just completed. At the other end of the scale was one physician who spent five years in internship and residency training. Another spent four years in a teaching hospital and rose to a position of considerable responsibility before entering general practice. One physician reported that he had served a six-month rotating internship, a year of straight medicine and two years of straight surgery, most of it in an excellent teaching hospital, before entering practice. The great variation in training encountered is evident from the above findings and will be dealt with further below.

Comparison with other physicians

The physicians in this study reflected the trends of the time with respect to internship. The official recognition of the internship as an educational experience by the Committee on Education of the American Medical Association in 1904 and the beginning of internship grading in 1914 probably influenced its popularity. In 1926 the number of internships available became equal to the number of medical graduates, making internships available for all graduates.[1, 2] Of the 14 doctors included in this study who graduated prior to 1926, two served no internship before going into practice. Training during the depression tended to be prolonged in comparison with the preceding and following periods. World War II was accompanied by speed-up programs in both medical school and graduate hospital training, with the advent of the "9-9-9" system," and its influence was noted in the lower incidence of physicians receiving more than one year of training. The more recent trend toward longer training is shown by the group graduating after 1946.

1. CURRAN, J. A.: *Trends in Medical Education*, "Introductory Remarks," pp. 111-117, Commonwealth Fund, New York (1949)
2. *"Internships and Residencies in New York City, 1934-37, Their Place in Medical Education,"* New York Committee on the Study of Hospital Internships and Residencies, Commonwealth Fund (1938)

TABLE 5

Graduate Hospital Training of 94 N.C. General Practitioners Compared with Groups from Country at Large

Internship and residency training	1930, 1935, & 1940 Graduates* General Practice	Present Study General Practice
Number of graduates	2,920	94
Total	100%	100%
Total with internship	99.4	94.7
with residency	33.3	29.8
without residency	66.1	64.9
Rotating or general internship	88.6	90.4
with residency	29.5	26.6
without residency	59.1	63.8
Other internship	10.8	4.3
with residency	3.8	3.2
without residency	7.0	1.1
No internship	0.6	5.3
with residency		1.0
without residency		4.3

* Adapted from Table 29, Weiskotten, H. G., "Trends in Medical Practice," *J. Assn. Amer. Med. Coll., 12:* 354 (1937) and Table 35, Weiskotten, H. G., and Altenderfer, M. E., "Trends in Medical Practice," *J. Med. Educ., 27:* 36, (1952)

In order to determine whether this sample might be considered reasonably representative of general practitioners in the country at large, the doctors studied were compared with those of Weiskotten and Weiskotten and Altenderfer[1, 2] (Table 5). Their results are based on questionnaires sent to all medical school alumni five years after graduation for the classes of 1930, 1935 and 1940. The present study included physicians graduating as early as 1914 and as late as 1950. The 11-year period beginning in 1930 and continuing through 1940 includes 36 of the present subjects, or 38.3 per cent of the total sample, and such a comparison appeared worth while. From this it appears that the doctors included in this study as a group appear to have received only slightly less training than the 1930, 1935 and 1940 medical graduates who responded to Weiskotten's questionnaire. The initial rotating internship enjoyed approximately the same popularity among the physicians in North Carolina as among the general practitioners in the country at large.

Comparison with the results obtained by the New York Committee on the Study of Hospital Internships and Residencies among the 1935 and 1936 graduates of five New York City medical schools revealed more training than in the present sample.[3] The nationwide study of general practitioners

1. Weiskotten, H. G.: "Trends in Medical Practice," *J. Assn. Amer. Med. Coll., 12:* 321-356 (1937)
2. Weiskotten, H. G. & Altenderfer, M. E.: "Trends in Medical Practice," *J. Med. Educ., 27:* 36 (September 1952)
3. "*Internships and Residencies in New York City, 1934-37, Their Place in Medical Education,*" New York Committee on the Study of Hospital Internships and Residencies, Commonwealth Fund (1938)

by the Academy of Pediatrics indicated that approximately 17 per cent had received no hospital training and an additional 4 per cent had received less than one year.[1] This study included doctors of all ages. In addition, North Carolina general practitioners in the present study appear to have received more pediatric training than general practitioners throughout the country.

Residency

The American Academy of General Practice has been interested in residency training for general practitioners and has suggested that the second year of the rotating internship be recognized as a residency in general practice.[2] Twenty-nine of the general practitioners studied served residencies prior to entering general practice. The general residencies were the most popular and were encountered over twice as frequently as any other type. Medicine and obstetrics-gynecology were the most frequent choices in this sample. In comparison with New York City general practitioners, slightly more North Carolina doctors served residencies; however, the residencies served by the New York physicians in general were considerably longer than those served by the doctors in this study.[3]

Types of training

The rotating internship is the usual preparation for general practice.[2-7] The popularity of the rotating program among the physicians in this study is illustrated by the fact that over 90 per cent had some rotating internship or residency in their training programs. The rotating programs usually consisted of equal periods on medicine, surgery and obstetrics-gynecology. Some programs included a fourth service which most often was pediatrics. Unfortunately, there were not enough doctors whose training was limited to straight services to permit a comparison with those whose training was limited to rotating services. In view of the continuing discussions about the respective merits of the two, information on this point would be desirable.

> Some of the rotating appointments were remarkable mainly for the number of different services involved. The most bizarre 12-month training encountered during the study included training in medicine, surgery, obstetrics and gynecology, pediatrics, orthopedics and traumatic surgery, anesthesia, emergency room, urology, anesthesia relief, tuberculosis and contagious diseases. In addition, at least three of the physicians had "rotating" appointments which were not divided by services in any sense. In these the interns rotated admissions to

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1. "Child Health Services and Pediatric Education," Report of the Committee for the Study of Child Health Services, The American Academy of Pediatrics, Commonwealth Fund, New York (1949)
2. "Internship & Residency Training for General Practice," *GP, 4:* 1-10 (November 1951)
3. "*Internships & Residencies in New York City, 1934-37, Their Place in Medical Education,*" New York Committee on the Study of Hospital Internships and Residencies, Commonwealth Fund (1938)
4. *Graduate Medical Education,* Report of Commission on Graduate Medical Education, University of Chicago Press (1940)
5. Commission on Medical Education, *Final Report,* N. Y., Office of the Director of the Study, (1932)
6. Woodruff, I. P.: "Training the GP," *Trends in Medical Education,* pp. 148-156, Commonwealth Fund, New York (1949)
7. Pullen, R. L.: *The Internship,* Charles C. Thomas, Springfield, Ill. (1952)

the hospital, regardless of service. One of these served in a private hospital in which he was assigned to certain doctors and followed their admissions whether medical, surgical, obstetrical or other.

The straight appointments were only rarely straight internships in the usual sense. These were commonly experiences obtained in addition to rotating internships, varied in length from six weeks to several years and were taken in medicine, surgery, urology, pediatrics, chemistry laboratory, psychiatry, tuberculosis, as well as others.

Quality of training

Certain assumptions about the quality of internship and residency training have previously been stated in connection with the training score calculation. Among the hospitals were some of the best known in the country, as well as a few that were small and obscure. A quarter of the physicians had all or some of their training in major teaching hospitals. 8.5 per cent obtained all their training in nonapproved hospitals and 4.3 per cent had no internship or residency. The remainder of the physicians were trained in approved institutions. A few of these were minor teaching hospitals.

TABLE 6

Distribution of Doctors by Length of Internship and Residency Training and Qualitative Rank

Length of Training Months	Qualitative Rank V	IV	III	II	I	Total
0-10	1	1	0	1	5	8
11-14	4	5	10	13	6	38
15-20	1	4	5	4	2	16
21-30	1	4	8	5	3	21
Over 30	0	1	4	0	0	5
Average length, months	14.4	17.8	21.4	15.3	12.2	

Relation of training to the quality of the physicians' work

In an attempt to determine what effect, if any, hospital training might have on the ultimate quality of medical care rendered by the various physicians, a number of comparisons were made between these items. Table 6 shows the distribution of the doctors by ordinal or qualitative rank in comparison with the length of hospital training. The distribution shows only the slightest suggestion of any correlation between these items. The group of four physicians who had no internships ranked below other groups. Among the doctors with more than 30 months of training all were ranked average or better. Thus the physicians with exceptionally short or long training appear to diverge in the expected directions. The numbers in both divergent groups are small and the results are not statistically significant. Between the extremes there is no suggestion whatsoever of any linear association between the length of training and the quality of the doctor's work.

TABLE 7

Distribution of Physicians by Quality of Training and Qualitative Rank

Classification of Training	Qualitative Rank V	IV	III	II	I	Total
All teaching	2		9	6	1	18
Part teaching, part approved nonteaching	1	3		1	1	6
All approved, nonteaching	3	7	12	12	10	44
Part approved, part nonapproved		3	1	3	1	8
All nonapproved	1	1	5	1		8
No hospital training		1			3	4
Total	7	15	27	23	16	88

In Table 7 the distribution of physicians by qualitative rank and quality of internship is shown. The absence of any clear relationship between these two items is apparent. Calculations of weighted means for each classification of training produces irregular results that emphasize the lack of association demonstrated by the distribution.

Comparison of the product of length and quality previously described as the training score with the physicians' qualitative rank showed less suggestion of an association than the previous comparison of length of training with qualitative rank. However, physicians with better records as medical students showed a higher number of appointments in teaching hospitals. This fact coupled with slightly longer total training time resulted in a higher training score. Thus, there is a linear association between academic performance and training score, but the differences were not great enough to produce statistical significance.

The surprising lack of correlation between training and the quality of a doctor's work immediately stimulated a search for the reason. Comparisons were therefore made between training and the physician's performance of specific functions on which his work was graded. (Tables 8 and 9) In Table 8 the length of hospital training has been compared with these specific functions (history-taking, physical examination, etc.) as discussed in Chapter III. It will be noted that the quantitative score is used here to describe some parts of the physician's performances. Table 9 represents a similar comparison with length and quality of training, as represented by the training score.

There appears to be a slight relationship between the length of the physicians' training and the excellence of the histories he takes. A comparison of the training score with the quality of histories taken by physicians reveals no evidence of any relationship. A comparison between length of training and physical examination indicates that there was an irregular, though small, improvement in quality with increased length. Training scores showed a similar relationship but these associations were

TABLE 8

Comparison of Length of Internship and Residency Training with Mean Scores on History, Physical Examination, Laboratory, Therapy, Preventive Medicine and Records

Length of Training (Months)*	No. Drs.	Mean Scores*					
		History	Physical Examination	Laboratory	Therapy	Preventive Medicine	Records
0-10	8	24.7	23.4	33.3	24.6	52.8	18.8
11-14	38	29.7	29.7	48.6	36.5	59.5	39.9
15-20	16	34.3	36.4	50.3	37.6	62.5	48.4
21-30	21	32.3	35.8	45.9	38.7	67.6	44.1
Over 30	5	40.0	40.1	47.9	47.2	70.0	40.0
	—	—	—	—	—	—	—
Totals	88	31.3	32.4	46.8	36.8	62.2	40.5

* Expressed as means of percentages of total possible weights which could be applied to each function in each practice.

TABLE 9

Comparison of Training Score with Mean Scores on History, Physical Examination, Laboratory, Therapy, Preventive Medicine and Records

Training Score	No. Drs.	Mean Scores*					
		History	Physical Examination	Laboratory	Therapy	Preventive Medicine	Records
0- 20	12	33.7	30.2	37.0	40.9	54.2	20.8
21- 28	29	30.0	29.1	45.0	32.6	59.9	41.1
29- 40	13	31.7	32.9	49.1	36.3	61.5	44.2
41- 60	23	28.3	34.4	49.5	36.2	64.4	44.6
61-192	11	37.0	38.7	53.9	44.8	70.4	47.7
	—	—	—	—	—	—	—
Totals	88	31.3	32.4	46.8	36.8	62.2	40.5

* Expressed as means of percentages of total possible weights which could be applied to each function in each practice.

not striking and did not prove to be statistically significant. There is also a slight difference, which is statistically significant, in mean laboratory scores of those doctors who had 10 months or less hospital training as compared with those with more training. This is logical. Most doctors would agree that less than a year of training is insufficient. Comparison of laboratory and training scores produced an apparent tendency towards linear relationship, but this was insufficient to be described as statistically significant.

A comparison of length of training and score on therapy reveals a tendency toward a linear relationship, but it does not reach statistical significance. When the training score is compared with the doctor's performance in therapy no association is found.

Training on specific services and its relation to the quality of the physician's work

The irregularity of the preceding results is apparent. Despite the lack of consistent correlation (only occasionally reaching a level that can be described as statistically significant) almost every result suggested that training was somehow affecting the doctor's performance. In a further attempt to determine if training had any effect on performance the internship and residency were broken down so that the time spent by individual doctors on each of four major services could be compared with the quality of their practices. The results are set out in Table 10 and are given in terms of mean qualitative ranks. The number of doctors for whom this comparison could be made varied from 71 to 76; data on training in medicine were available for 76 doctors. It will be recalled that 88 doctors were ranked. Of these one or two could not recall the details of their internships with sufficient accuracy to permit their use, while others had internships in which time devoted to specific services could not be identified. Physicians with no training on a specific service are included in the appropriate "under three months" category. The services considered

TABLE 10

Relationship Between Length of Training on Specific Services and Physicians' Mean Qualitative Rank

Length of training in months	Medicine		Pediatrics		Surgery		OB-Gyn.	
	No.	Mean Qualitative Rank	No.	Mean Qualitative Rank	No.	Mean Qualitative Rank	No.	Mean Qualitative Rank
Under 3	15	2.53	40	2.98	16	2.81	35	2.95
3	27	2.63	15	2.47	26	2.88	20	2.45
4	16	2.81	7	2.57	15	2.80	8	2.75
5-8	13	3.31	9	3.11	10	2.80	3	3.33
Over 8	5	3.60*		**	7	2.86	6	3.17

* All five in this group had a year or more of training in internal medicine. The smallness of this group with a more prolonged internal medicine training is emphasized by the fact that they constitute only 6.5% of the physicians who could be classified by this characteristic.

** There was a single physician in this category and he has been assigned to the preceding group.

here are the only ones represented sufficiently often to allow this type of comparison.

It is apparent that service on pediatrics, surgery and obstetrics-gynecology show no constant or regular association with the quality of the doctor's work, as judged in this report. On the other hand, there is no doubt about the linear association of increasing training in medicine and the quality of the physician's work (P = less than 5 per cent by extraction of the linear factor). The regularity of this association is emphasized by the random character of the weighted averages in relation to length of training on other services. Among the latter there is no linear association and attempts to find significance in the rank of specific groups were unsuccessful. For example, the nine physicians with more than five months pediatric training were not significantly different from the remainder of the group with four months or less training.

In Table 11, essentially the same comparison as that shown above is made. In this table the average length of internship and residency is shown as the variable in relation to specific services and the mean qualitative rank of the physicians. The consistent association of longer average training in internal medicine with better practice is again unique. The longer training in medicine of physicians in the three rank groups, V, IV, and III is significantly different from those in ranks II and I (P = 2.5 per cent).

When the population used in calculation of the effects of medical training is defined to include only physicians who had some medical internship a somewhat different result is obtained from that shown in Table 10. It appeared that the linear relationship observed becomes manifest only after four months' training has been obtained. There was no suggestion of any difference between physicians with three months' training and those with one and a half or two months. There is some hesitancy to limit the population as defined here but the suggested result fits what is known about learning of complex skills. The initial period of learning is very slow. It is quite possible that, on an average, the effects of medical training become manifest after a latent phase. The possibility that this is one segment of a conventional learning curve is likely. Physicians with

TABLE 11

Average Length of Training in Months on Specific Services in Relationship to Physicians' Mean Qualitative Rank

	V		IV		III		II		I	
Service	No.	Mean Months	No.	Mean Months	No.	Mean Months	No.	Mean Months	No.	Mean Months
Pediatrics	7	0.86	13	2.85	23	2.52	18	3.25	10	1.45
Surgery	7	2.57	14	7.00	24	3.50	18	4.03	11	4.14
OB-GYN	7	1.29	13	3.81	23	4.78	18	3.14	11	1.86
Medicine	7	4.93	14	4.93	25	5.72	19	3.26	11	2.41

more than a year of training in medicine all ranked average or better. This may be an example of another part of the learning curve. Calculation of the training score for medical internship and its comparison with the quality of a doctor's work appeared to show a linear relationship but it is not statistically significant. A comparison between training scores calculated for pediatric, surgical and OB-GYN services shows an even more irregular relationship than comparison of length of training alone with the quality of a physician's work. The quality of medical training does not appear to be as significant as its length in influencing subsequent performance.

The suggestive association between the over-all length of the internship and residency and quality of physicians' performances in some areas and the failure of association with others may be clarified by this finding that variation in the doctor's performance was found to be associated with his training in internal medicine. The effect of the length of training in internal medicine was therefore examined in relation to the specific items on which the physician's work was characterized.

The association previously found for the whole was found for the parts although there was some variation. The doctors who had less than three months training in medicine scored better on history taking, physical examination, laboratory use, therapy and preventive medicine than those with three months. The differences were small and not statistically significant. When either of these groups separately or in combination are compared with men whose training in medicine was of four or more months' duration, a definite divergence is apparent. The latter group clearly was better and became better as their training was prolonged. It appeared that on the average passage from three to four months again represented a critical training interval or threshold at which an effect became manifest. The results are shown in Table 12.

Similar results were obtained in comparison of specific functions with the doctor's training score in internal medicine. The conclusion that the

TABLE 12

Relationship Between Training on Medicine and Performance of Specific Functions*

	Months of Medical Training		
	3 or less	4	5 or more
Number	41	17	18
History	26.7	38.3	40.7
Physical Examination	27.7	38.0	41.9
Laboratory	47.1	50.5	51.1
Therapy	33.6	45.4	43.5
Preventive Medicine	58.9	67.8	68.2
Records	34.1	60.9	48.2

* Expressed as mean percentages of total possible weights which could be applied in each practice.

length of a general practitioner's training on medical services is closely related to the care and diligence exercised in his practice is inescapable.

In another section it has been shown that the average quality of a doctor's work ultimately reflects the effects of age. It was reasoned that the favorable effect of medical training demonstrated above should be greatest on the younger physician closer in time to his internship or residency. Medicine changes rapidly so some of the judgments being made were based on skills which some doctors have had to acquire while in practice and which others had learned in medical school or internship. Accordingly, the effect of training in internal medicine was compared with the doctors' performance at various ages (Table 13).

TABLE 13

Relation of Length of Medical Training to Mean Qualitative Rank in Various Age Groups

Length of medical training in months	Age Group 28 - 35 No.	28 - 35 Mean Qualitative Rank	36 - 45 No.	36 - 45 Mean Qualitative Rank	46 - 65 No.	46 - 65 Mean Qualitative Rank
3 or less	10	2.4	15	2.9	17	2.5
4 or more	15	3.5	9	3.3	10	2.4
Totals	25	3.0	24	3.0	27	2.4

The effects of training are apparent in the youngest age group where there is a significant difference between the mean rank of physicians with three months or less and those with four months or more training in medicine (P = less than 5 per cent). It may be deduced from the trend of differences between the means for the two groups on the basis of duration of training in internal medicine that the effects begin to disappear after age 35. Although this is a cross-sectional study, certain inferences appear justified. It will be noted from the mean qualitative rank of the group with three months or less of training that physicians in the 36-45 age group are apparently better than those in the youngest and oldest age groups. Testing of this rise and fall in performance indicates that it is statistically significant. Thus, it would appear that physicians with less than three months training in internal medicine reach their peak performance during age 36-45 years. In contrast, those with four months or more of such training begin performance at a higher level and evidence a gradual decline with age.

It would be contrary to logic to expect that physicians did not continue to learn in practice so that the improvement shown by the group with the shorter period of training may be real. Diminishing skill of physicians with longer periods of training may therefore be a composite trend determined by opposing forces. While the effects of good training are wearing off this trend is opposed by the learning process in practice which, it may be assumed, operates in the case of the initially better physician as well as the initially poorer physician. It will be noted that significant differ-

ences in the mean rank of the doctors in practice are present only in the youngest age group. The differences appear to persist into the 36-45 age group but are no longer significant. In fact, the linear component of the interaction between age and length of training is significant, indicating that the difference between the two training groups dissolves with age.

The above figures are based entirely upon the ordinal or qualitative ranking. When the quantitative index with its much broader distribution is substituted, essentially the same trend and differences are found with relation to training.

The training score calculated only on medicine for the 28-35 age group showed one significant relation to quality. The small number of doctors (5) with training scores below eight were performing at a lower level than doctors with higher scores. Although this calculation produced a linear relationship between score and quality, the linearity was insufficient to be significant.

In a previous section dealing with medical education it was shown that quality of practice of doctors in the 28-35 age group was related to academic rank. Beyond this age the effects of performance in medical school are apparently lost insofar as they are reflected in practice performance. In Table 14 the relationship between academic rank and training in internal medicine and their effects upon the performance in practice for doctors

TABLE 14

Relationship of Medical School Rank and Length of Training in Internal Medicine to Quality of Doctor's Work as Indicated by Mean Qualitative Rank in the 28 - 35 Age Group

	Medical School Rank							
	Upper Third		Middle Third		Lowest Third			
Length of Medical Training in Months	No.	Mean Qualitative Rank	No.	Mean Qualitative Rank	No.	Mean Qualitative Rank	Total	Mean Qualitative Rank
3 or less....	2	4.0	4	2.8	4	1.3	10	2.4
4 or more	3	4.3	10	3.5	2	2.0	15	3.5
Total	5	4.2	14	3.3	6	1.5	25	3.0

The following facts emerge from examination of Table 14:

1. All men graduating in the upper third of the class exhibited a Mean Qualitative Rank (4.2), significantly different from men standing in other segments of their class in medical school (2.7) (P = 2%). Men graduating in the lowest third of the class were ranked significantly lower (1.5) than other groups (3.5) (P = less than 0.1%).
2. Similarly, all men with four months or more of training in internal medicine ranked significantly higher (3.5) than those with 3 months or less training in internal medicine (2.4) (P = 5%).
3. Men standing in the upper third of the class and having had four months or more of training in internal medicine (4.3) were, on average, better than all other groups (2.9) (P = 10%). Men graduating in the lowest third of the class and with three months or less training in internal medicine had a mean rank (1.3) significantly lower than all other groups (3.4) (P = less than 2%).
4. In each specific third of the class, the differences between doctors with three months or less and those with four months or more of training in internal medicine were not significant.
5. In each of the two training intervals, there is a significant linear relationship between medical school rank and quality of practice (P = 5%).

between the ages of 28 and 35 have been examined.

Breakdown of physicians in the 36-45 age group by medical school rank and training, as was done in Table 14 for the 28-35 age group, shows that these differential effects are no longer present in significantly measurable amounts. Substitution of years out of medical school for age in Table 14 produced essentially the same results as those shown.

The comparison of the quality of work of physicians in the 28-35 age group by medical school rank and by training scores (instead of length of training) calculated for internship or residency in medicine only produced results almost identical with those shown in Table 14. In the single age group under examination here (28-35 years) the quality of internship as defined at the beginning of this section does not appear to increase the significance of the results.

When the length of surgical, pediatric or obstetric training is compared with mean rank of doctors at various ages, there was no association like that found for the medical internship. In addition, the time spent in obstetrical training and scoring of obstetrical training were compared with prenatal care given by the 50 physicians who practiced obstetrics and so could be ranked with respect to this question. No correlation was demonstrated between either duration of obstetrical training or obstetrical training score and the quality of the physician's prenatal care. *The doctor's excellence in carrying out prenatal care increased directly with the amount of his training in internal medicine.*

Miscellaneous observations on training

Several medical schools award doctorates only after the student has completed an internship satisfactory to the medical school. This requirement has probably justified its purpose of inducing students to take an internship. Doctors who had been graduated from schools with this rule had served internships in all types of institutions, including nonapproved hospitals.

Doctors usually expressed satisfaction with their internship in contrast to their frequent dissatisfactions with their medical education. A typical doctor who had served an internship in an approved, though (in the authors' opinions) thoroughly mediocre, nonteaching hospital stated, "They taught us to do things and that's what's needed in general practice!" A few of the doctors had served their internships or residencies in hospitals which could not seriously be regarded as training institutions.

Another interesting finding was that doctors who, while in medical school, had planned to go into practice of internal medicine or pediatrics achieved an average qualitative rank which was significantly higher than that achieved by doctors who originally had planned to enter general practice or the practice of one of the other specialties. Although the former group did not rank higher in medical school and did not have longer periods of hospital training, they did have an average training period of

internal medicine which was significantly longer than the other doctors in the sample.

It is interesting to note that the doctor's journal purchase habits, which will be shown to be related to his excellence, showed no direct relationship with training in internal medicine.

DISCUSSION

A number of facts of interest emerged from the examination of the education and training of the doctors who participated in this study. It is well known that the South is economically and educationally different from the rest of the country and, in addition, has social problems which are not so acute elsewhere. The authors have long been concerned whether the results obtained in this study would be duplicated elsewhere. It has been the feeling of the research workers that the results obtained here represent human variation which would probably be found in other regions. The training taken by these doctors is similar to the training taken by doctors in the country at large. They had received their training in a wide variety of hospitals in all parts of the United States. On the other hand, there was no other group of general practitioners with whom the present sample could be compared as to medical school performance. However, the physicians studied came from many medical schools and had exhibited all degrees of academic success, so there is no reason to assume an adverse selection. It can therefore be stated with considerable assurance that in terms of medical education and training the physicians who participated in this study are not evidently different from general practitioners at large.

The effects of medical education and training on medical practice have been presented in terms of mean qualitative scores. Although there can be little doubt of the statistical and practical importance of the variations of these means, it should be pointed out that the range of individuals in some of the classes was great.

It was fortunate for the purpose of this study that the variation in academic performance and the length and quality of internship and residency training of the doctors was so variable, for it made comparisons with other measurable factors possible and meaningful. The finding that there was no strong relationship between such important facts as the over-all length of training or whether a doctor interned in a teaching or a non-approved hospital and the later quality of his practice was contrary to usual beliefs. It was found that performance in medical school and duration of training in internal medicine were directly related to performance in practice. This relationship lasts only a few years. The association between good performance in medical school and good practice will occasion little debate.

It might be suggested that the association between training in internal medicine and quality of practice is an artifact due to the nature of the judgments made. The criteria used for description of the individual practices are emphasized more in internal medicine than in other disciplines. Although these criteria deal almost exclusively with the problem of making

a diagnosis, there can be little disagreement that this should be the central core or skill about which any practice is built. However, the doctors who were excellent in application of these skills were also good in all fields in which judgments could be made. As has been mentioned in a previous chapter, the physicians who were superior by these criteria were also the doctors who were most likely to exhibit some understanding and grasp of psychiatric problems, who practiced the most thorough well-child care, and who performed the most careful, diligent prenatal care. Doctors who did surgery as part of general practice and those whose practices were largely limited to obstetrics or pediatrics tended to be better than average. The differences did not reach statistical significance for any group. This would, nevertheless, seem to confirm the belief that the standards used contained no bias with respect to fields other than internal medicine. It is possible that different criteria applied to aspects of practice not considered in this study might have produced different results. Operative obstetrics or surgery judged by an obstetrician or a surgeon might have reflected specific training just as directly as the skill in history taking, physical examination and use of the laboratory reflect medical training.

No association was found between length or quality of training in obstetrics and the quality of prenatal care rendered. Conceivably, a doctor might exhibit great skill and judgment in delivering his patients even though the prenatal care he rendered left something to be desired. However, this concept would be completely inconsistent with the observations previously mentioned that the quality of practice is not a compartmentalized but an overall characteristic.

The inconsistent effects of training on various services upon later performance suggest several explanations. There is the possibility that general practitioners have been selected. There is no way of knowing if any hypothetical selection for general practice may have been due to lack of interest in any specialty field. The possibility of explaining these different effects on a divergence in the quality of training on various services has been suggested. During the course of this study the dean of one medical school pointed out that the careful, diligent habits of inquiry taught on some services are frequently not matched or unlearned on other services. However, if the quality of training were an important factor, there should be also a difference between men trained in teaching hospitals (with their full-time staffs and greater attention to teaching) and those trained in nonteaching or even nonapproved hospitals. No regular difference was found. The possibility that more able or interested physicians seek out longer training in internal medicine must be considered. In the authors' experience, however, medical students seeking rotating internships select hospitals for many reasons rather than specifically for the amount of training in internal medicine.

The most plausible explanation for these findings lies in the character of medical training. It is here where the techniques of history taking and the physical examination are taught and the laboratory is used most frequently. On medical services a holistic approach is generally more evident,

in contrast with obstetrics where major attention is necessarily given to pregnancy and its problems, or surgery where certain diseases and special techniques are likely to be stressed. Why pediatrics did not have an effect like internal medicine remains unexplained. The rather recent development of pediatrics as a separate service and the still general inadequacy of both education and training suggest themselves as possible explanations.[1]

A positive association of education and training with practice was clear in the case of the younger doctors. Students learn at different rates. Some physicians had probably mastered the clinical method rapidly as was attested by their superior academic performance and the fact that they were better doctors. Other physicians gave evidence of slower acquisition of clinical skill. They were not outstanding students. With longer training in internal medicine they became better doctors. If their training was short they failed to acquire the necessary clinical skills.

Human variability in speed of mastering a complex skill characteristically shows a normal distribution and it seems probable that this is the phenomenon being measured. If this is the case, the one year of rotating internship which is the usual training for general practice does not provide long enough training, particularly in internal medicine, to permit many physicians to master the clinical method. Forty-two of the 76 physicians for whom details of training were available had spent three months or less on the medical service.

Among physicians beyond age 35 several differences are found in the quality of work as related to education and training. First, the effect of academic performance is no longer identifiable. Next, the differences in performance as they related to training in medicine in the 36-45 year age group are less than those exhibited by the younger group. While the well trained physicians showed little difference from the younger age group, the less well trained doctors in the 36-45 age group appeared to be better. It can be inferred that the less well trained men continued to learn while in practice. After age 45 there are no longer any identifiable associations between education or training and practice. Lastly, the decades beyond age 45 are accompanied by a gradual decline in the over-all quality of work.

It seems likely that the individual's interest in medicine contributes to these many differences. There were physicians who had been good medical students and had received good training, who were not exceptional physicians. There were others whose performance as students was unusually poor, whose internships were of indifferent quality, who nevertheless became superior physicians. While the quality of practice tended toward an average with increasing age of the physician group there were older physicians whose performance was superior and whose practices showed every evidence of continuing improvement. The identification of the individual who will become a good doctor despite indifferent training or the doctor whose interest in practice will not lag after a few years will probably be as productive of better quality of practice as any other measure.

1. "Child Health Services and Pediatric Education," The American Academy of Pediatrics, published by the Commonwealth Fund, New York, (1949)

V: The Physician's Medical Intellectual Life

A. Refresher Courses

POSTGRADUATE MEDICAL EDUCATION is a relatively new development. Writing in 1940, the Commission on Graduate Medical Education stated, "Twenty years ago any widespread use of postgraduate education as so defined was almost unknown, but in the interim it has developed rapidly until today scarcely any region in the country is without some form of postgraduate opportunity."[1] It is probable that between 1940 and the present time the amount and variety of postgraduate education offered to practicing physicians has again increased markedly. Vollan, indeed, found that among a group of doctors who answered a questionnaire, over 75 per cent had attended some postgraduate courses in the preceding five years and had averaged seven days per year.[2] He noted the probable bias created by his questionnaire and estimated a realistic average was close to four days per doctor per year. He noted further that over 2,000 postgraduate courses involving a total of 140,000 hours were given in 1953. Time devoted to postgraduate education diminished among doctors who had been out of medical school longer.

Various discussions of the purposes and the ends of postgraduate education agree quite well. One may start with the objectives of undergraduate medical education as enunciated recently in the Journal of MEDICAL EDUCATION.[3] It is stated that the medical school does not assume responsibility for providing each student with a detailed systematic body of knowledge concerning each and every medical and related discipline. The specific aims related to postgraduate study therefore follow logically, "to help the student establish essential habits . . . of continuing self-education." The Commission on Graduate Medical Education stated as its first basic principle of postgraduate medical education the following: "Postgraduate medical education should aim to keep the physician abreast of current knowledge in his present field of practice."[4] All writers in this field emphasize the difficult nature of the practicing physicians' problems in confronting a rapidly changing field.

1. *Graduate Medical Education*, Report of the Commission on Graduate Medical Education, University of Chicago Press (1940)
2. VOLLAN, D. D.: A lecture delivered before the 50th Annual Congress on Medical Education and Licensure, February 1954, Chicago.
3. The Objectives of Undergraduate Medical Education, *J. Med. Educ., 28:* 57-59, (1953)
4. *Graduate Medical Education*, Report of the Commission on Graduate Medical Education, University of Chicago Press (1940)

The field of postgraduate medical education is obviously one that is expanding and appears to be rapidly burgeoning into newly found importance. The large numbers of symposia given by medical schools, medical societies or local academies of medicine, the educational requirements of the American Academy of General Practice, and the recent and interesting experiments with television all give evidence of the activity within the field. These together with circuit riding in Kansas,[1] and the comprehensive program of the Bingham Associates in New England show the varied experiments being undertaken in educational methods. For a comprehensive treatment of this subject the reader is referred to the recently published study by Vollan.[2]

METHODS OF STUDY

In addition to attempting to learn whether the doctor had any specific program or plan of postgraduate education, a list was made of the specific medical society meetings which he had attended during the previous twelve months. It was often found that the doctor could not remember the exact number that he had attended but his estimate in each case was accepted. Some medical societies have very active educational programs in connection with their meetings whereas others have only infrequent speakers or clinical discussions of any sort; so the character of the society meetings was often recorded. The doctors were also asked about postgraduate courses attended during the previous 12 months. The subject of the course and the duration in days were noted. Lastly, the doctor was queried as to the number and type of hospital and other staff meetings that he had attended.

A simplified procedure was adopted for totaling the amount of time which a doctor spent in postgraduate work. The system, which is described below, has tended to give too much credit to the doctors who do small amounts of postgraduate study and too little to doctors who do a large amount. Nevertheless, it has produced a good spread. Under this scheme the doctor was given credit for a single hour of postgraduate study for each medical society or hospital staff meeting attended. If the hospital staff or the medical society limited itself to business with no clinical meetings, no credit was given. For each full day of postgraduate work, four hours' credit was given. Attendance at the State Medical Society meeting was allocated four hours' credit. District medical society meetings were credited with a single hour. The University of North Carolina conducts a series of courses throughout the state which include afternoon and evening sessions. Two hours of credit were given for each of these meetings. Information as to attendance at recognized regional or national meetings was also obtained. The length and character of the many meetings reported are diverse, so credit for 12 hours of study was arbitrarily assigned for attendance at each. Four hours were also allocated for each day of formal course study.

The conventions set out in the previous paragraph are approximations only and are therefore called "credit hours" hereafter to emphasize this point. The tenuousness of equating credit hours with education will be readily understood by the reader.

RESULTS

Amount and types of postgraduate study

Among the 94 doctors visited, it was possible to get a history of educational activities in 93 instances. The amount of postgraduate education

1. Diamond E. G.: *JAMA, 156:* 95-97 (1954)
2. Vollan, D. D.: *JAMA, 157:* 703-708, 912-920, 1119-1125, 1302-1309, 1492-1498 (1955) Ibid, *158:* 39-43, 184-187, (1955)

undertaken varied from 0 hours per year to 110. Among the 93 doctors there were 38 who had a formulated plan or program of study. There were a few doctors who stated they had no definite plan of study but it was quite clear from their remarks that they had a policy with respect to postgraduate education. Twenty-one of the doctors who were given credit for having a study plan used or gave as their plan the requirements of the American Academy of General Practice. The number of doctors who had a formulated plan of study increased materially with the amount of postgraduate activity undertaken.

Various attempts were made to subdivide the doctors on the basis of the number of credit hours of study. Reasonable groupings were obtained by separating the doctors as follows: Less than 20 hours, 20 to 39 hours, 40 to 59 hours, and 60 hours or more. There were 30 doctors who were given credit for less than 20 hours of postgraduate study in the preceding year. In general the doctors in this group attended only the county medical society meetings and, where available, the local hospital staff meetings. There were a few doctors who attended virtually no clinical or scientific meetings.

There were 24 doctors who were given credit for doing 20 to 39 hours of postgraduate work in the preceding year. Among this group of doctors there was conspicuous attendance at medical society and hospital staff meetings, and in addition, most of the doctors did from one to three days postgraduate work during the year.

In the group given credit for 40 to 59 hours of postgraduate study, there were 24 doctors. Among this group attendance at medical society and hospital staff meetings was pronounced; with few exceptions, they also attended numerous study or refresher courses organized for general practitioners.

The final group of doctors, 15 in number, who received credit for more than 60 hours of postgraduate education were, of course, the most active group of all.

> For example, one doctor in this group who complained about the fact that he was too busy to meet the study requirements of the AAGP, had a very active intellectual life in his own community. Staff meetings at several hospitals, plus section meetings in obstetrics and surgery, all of which were of a clinical character, gave this man almost biweekly meetings to attend. One doctor in this group who received credit for about 90 hours of postgraduate work during the preceding year had attended nine county medical society meetings, the state medical society meeting, several district meetings, the Southern Medical Association meeting, the American Medical Association's annual meeting, several regional meetings of the Academy of General Practice, the highly technical meetings of two specialist societies, in addition to attending two postgraduate sessions totaling about five days. He also regularly attended all his local hospital staff meetings. The most remarkable doctor of the whole group was one from a very small town who was intensely interested in one of the medical specialties. Many of the meetings which he attended were among the most specialized and technical in the country, at which he frequently discussed his own somewhat tentative and hesitant research activities with some of the best known authorities in the field.

In Table 15 the doctors are classified by the credit hours devoted to postgraduate study in the preceding year as compared with their activities in formal graduate work. Under "formal scientific sessions" are grouped all postgraduate courses given at universities, symposia or special meetings

TABLE 15

Relation of Amount of Postgraduate Work to Attendance at Formal Scientific Sessions

Total Credit Hours Post-graduate Study	No. of Doctors	Attended Formal Meetings	
		No. of Doctors	Percent
0 - 19	30	9	30.0
20 - 39	24	22	91.7
40 - 59	24	24	100.0
60 plus hours	15	14	93.3
Totals	93	69	74.2

sponsored by medical societies, special courses as well as meetings of medical organizations such as the State Medical Society and the American Medical Association at which there are extensive clinical and scientific programs. The meetings so classified are more costly in terms of money and absence from one's practice than the local hospital or county society meetings. They also require careful planning and may therefore be assumed to be indicative of greater interest in continuing study . . . 69 of the 93 doctors or 74 per cent had attended some formal postgraduate medical course or scientific meeting in the preceding year.

The types of meetings attended are given in Table 16, where they have been grouped according to subject matter. The list contains the meetings conducted by universities and other recognized bodies, special symposia sponsored by county medical societies or specialist groups and meetings such as state or national medical societies which are usually of a general character.

TABLE 16

Types of Formal Postgraduate Meetings Attended by 69 Doctors in Sample

Subject	No. Attended
General	128
EKG	8
OB-GYN	8
Surgery	8
Cardiology	7
Pediatrics	6
Psychiatry	1
Geriatrics	1
Endocrinology	1
Industrial Medicine	1
Liver Disease	1
Physiology and Medicine	1

Over 50 of the general meetings attended were state or national society meetings. It can be seen that meetings of a general character were by far the most common type selected. Meetings treating with electrocardiography, obstetrics and gynecology, surgery, cardiology and cardiovascular disease, and pediatrics enjoyed considerable popularity. Other meetings dealing with geriatrics, psychiatry, endocrinology clearly indicate a high degree of special interest in these subjects on the parts of the physicians attending.

General practitioners are busy people and fairly careful planning is usually necessary before the doctor can take time to attend meetings. Although quite a few doctors in this sample had attended meetings in distant parts of the country, the bulk of the postgraduate work was done locally. Since meetings of a general character are widely available locally this may explain their apparent popularity.

Place of practice and postgraduate study

When the amount of postgraduate work done is compared with the location of the doctor's practice (Table 17), it can be seen that the population of the city or town in which the doctor practices has some influence on the amount of his postgraduate education. In the case of larger cities active hospital staff organizations encourage extensive attendance at clinical meetings. Among the physicians practicing in cities of more than 50,000 population there is only one who was given credit for less than 40 hours of postgraduate education in the preceding year.

TABLE 17

Relationship of Credit Hours of Postgraduate Study to Population of Place of Practice

Population, place of practice	Credit Hours				Average: hours/yr.
	0-19	20-39	40-59	60 plus	
Under 1,000	7	4	1	0	10.9
1,000 - 2,499	7	1	9	4	40.9
2,500 - 9,999	10	10	5	5	34.5
10,000 - 49,999	5	9	5	2	32.8
50,000 and over	1	0	4	4	59.4
Totals	30	24	24	15	36.0

It appears that frequent attendance at scientific meetings was not characteristic of doctors in towns of less than 1,000 population. There were pronounced differences between physicians in towns of 1,000-2,499 and those practicing in towns of less than 1,000 population. The former physicians did more formal postgraduate study than physicians practicing in most other communities, while the group practicing in the smallest villages were different from all other physicians in the small total amount of time allocated to postgraduate study.

There were quite a few doctors who remarked that they wished that some form of regular postgraduate medical education were available in

their area. Such statements were frequently made by doctors who suffered from real isolation in the coastal areas or in the mountains, but they were also heard with considerable frequency from doctors whose travel problems could not be regarded seriously. Distance *per se* was often not so much a problem as the physician's responsibility to his patients. When he has a patient in labor the physician will attend a local meeting but usually will not feel free to leave town. In view of the difficulties encountered by the doctor in attending scientific meetings, it seems likely that the character and frequency of the meetings attended often is determined more by availability than by what the physician may desire. The frequency with which city physicians attend meetings testifies to the importance of locally available sessions. However, among physicians who had to leave their practices to study or attend meetings, the factor of distance was an individual matter deterring some but not others.

Income and postgraduate study

Postgraduate study obviously must be paid for and it is not cheap. Losses due to absence from practice must be added to course fees and traveling expenses in calculating its true cost. It was expected that there would be a correlation between the doctor's income and the amount of postgraduate study. Surprisingly little was found. In the case of net income there was no indication of any relationship. There is a slight increase in the amount of postgraduate work as the doctor's gross income rises, but the amount is not great and appears to be of no practical importance.

Age and postgraduate study

There is a generally held opinion that recently graduated doctors have better habits of study than do the products of earlier medical education. The relationship between age and postgraduate study is shown in Table 18. The amount of postgraduate work undertaken by the doctors of various age groups was fairly uniform except for doctors in the youngest and oldest

TABLE 18

Distribution of Doctors by Age and Amount of Postgraduate Work in Preceding Year

Age Group Years	Credit Hours Postgraduate Study in Year					Average Hrs. Postgraduate Study	Percent doing more than 40 hrs. Postgraduate Study
	0-19	20-39	40-59	60 & Over	Totals		
Under 30	3	2	0	0	5	18.6	0
30 - 39	10	10	10	4	34	37.6	41.0
40 - 49	6	5	11	5	27	42.2	62.9
50 - 59	6	6	3	6	21	38.5	42.8
60 & over	5	1	0	0	6	8.5	0
Totals	30	24	24	15	93	35.9	56.9

decades studied, both of whom did considerably less. The youngest physicians who are establishing practices probably have less time for study, whereas those in the oldest age group are approaching the age of diminished activity or retirement and consequently would be expected to exhibit less interest in this field. The steady increase in the amount of postgraduate study to a maximum in the fifth decade of life and a diminution thereafter suggests that the physician's age is a most important factor. The last column shows the percentage of physicians of different age groups undertaking more than 40 hours of postgraduate study in the preceding year. It can be seen that most was done by doctors in the fifth decade. The increasing amount of postgraduate work which was referred to in the introduction to this section seems to be characteristic of all doctors and not the prerogative of the more recent medical graduates.

Group practice and postgraduate study

It is generally assumed that partnerships and group practice facilitate postgraduate study. Examination of the data shows that a somewhat higher percentage of physicians in groups did "formal" postgraduate study and that they also did slightly more postgraduate study than physicians in solo practice. The differences did not quite reach statistical significance. Conceivably a larger sampling might have shown that the difference is real. The observed differences were not great and one must conclude that the fact of having or not having a partner is not a major determinant of the amount of time a physician devotes to study or meetings away from his practice.

Medical education and training and postgraduate study

Successful students would be expected to exhibit good habits of study to a greater degree than students who were less successful in medical school. Academic success in medical school was therefore compared with habits of postgraduate study. Doctors who graduated in the top third of their medical class averaged 40.8 hours of postgraduate study, those in the middle third, 31.9 hours, and those in the bottom third, 37.6 hours per year. The differences are small and inconsistent. It is only possible to conclude that the characteristics of a doctor which, on one hand make for success in medical school and those which, on the other hand, cause him to continue his medical studies in practice as evidenced by attendance at scientific meetings or postgraduate study are not closely related.

The type and length of internship might also be expected to shape a doctor's postgraduate study habits in the same direction as would be expected from his medical education. In comparing the length of the doctor's training with postgraduate study no consistent relationship was found. It appears that the doctor's postgraduate study habits are not influenced significantly by the length of his training. This result is at variance with Vollan's demonstration of an apparent linear relationship between length of training and mean number of days of postgraduate work per year.[1] Nonresponse to

1. Vollan, D. D.: *JAMA*, *157*: 912-920 (1955)

Vollan's questionnaire was quite high and hence self-selection may have altered his results. No significant relationship between internships in teaching or other hospitals and subsequent postgraduate study habits were found. Training in internal medicine which was shown to have a closer relation to the quality of a doctor's work showed none with postgraduate study.

In the section dealing with internship and residency, a training score that gives credit for the defined quality of training as well as its length is described. Comparison of the training score with postgraduate study again revealed no relationship. It may be concluded that quality and length of training taken together are not decisive in shaping the doctor's postgraduate study activities.

Effect of postgraduate study on the physician's qualitative rank

In Table 19 the qualitative grades assigned are compared with the physicians' postgraduate study. There are increased amounts of study associated with the top rank and smaller amounts with the lowest rank. The small differences are not significant.

TABLE 19

Distribution of Physicians by Postgraduate Study and Qualitative Rank

Hours Postgraduate Study per Year	Qualitative Rank					Mean Qualitative Rank
	V	IV	III	II	I	
60 & over	1	1	5	4	2	2.61
40 - 59	4	5	7	6	1	3.21
20 - 39	0	6	7	6	5	2.58
0 - 19	2	3	8	7	8	2.43
Totals	7	15	27	23	16	
Average Hours Postgraduate Study in Year	47.0	35.5	37.5	36.3	27.7	

Determination of the mean rank grades for each postgraduate group showed a concentration of superior physicians doing 40-59 hours annually. This group is significantly different from the other three (P is less than 5 per cent). Why there is a concentration of the best physicians in this group is not known. As can be seen, some of the superior physicians undertook very little educational work and some of the poorest were among the most assiduous postgraduate students. The distribution obtained suggests that rank and study are not related in linear fashion. It is interesting to note that Vollan suggested a mean of 50 hours of postgraduate study per year is a "reasonable amount" to expect. The concentration of better physicians about this mean may indicate that this is indeed the case.[1]

1. VOLLAN, D. D.: *JAMA, 158:* 184-187 (1955)

It is possible that attendance at meetings away from the doctor's home might be indicative of greater interest and keenness than the total credits given for postgraduate study. Accordingly, a comparison was made of doctors who attended only local hospital and county society meetings and the others who undertook attendance at meetings and courses which took the doctor away from his practice and are designated as "away" in Table 20. Doctors whose postgraduate work was limited to attendance at local medical society and hospital staff meetings (the zero group of Table 20) ranked conspicuously lower than doctors who did some formal postgraduate study. Among the latter group it appeared to make no difference whether the formal postgraduate study was in excess of 40 hours per year or less than 10. The weighted averages as calculated above for the whole group doing some formal postgraduate study was 2.93, compared with a weighted mean rank of 2.04 for those doing none. This can be interpreted in two ways. Either good doctors tend to do formal postgraduate study or doctors are made better by doing it.

TABLE 20

Relationship Between Attendance at "Away" Postgraduate Courses and Quality of Physicians' Work

Hours "Away" Postgraduate Study	No. Doctors	Mean Qualitative Rank	
0	22	2.04	
1 - 9	15	3.06	
10 - 19	19	2.73	
20 - 29	11	2.72	- 2.93
30 - 39	9	3.22	
40 & over	12	3.00	

Some observations of meetings and study problems

During the course of this investigation opportunities presented themselves to attend a number of meetings of a clinical or scientific character with practitioners. Much of the postgraduate education offered the practitioner is concerned with therapeutic procedures and often with the newest methods of "handling" and "managing" patients in terms of therapeutic procedures. The variability in the skills and practices of the doctors is such that some of them may benefit considerably by this type of discussion, whereas others need teaching concerned with basic essentials such as the performance of a physical examination or study of the common heart sounds. Much of this type of education is given without first making the necessary examination so as to know what is needed. The extent or complexity of many lecture subjects was patently too great for many practitioners to absorb in a single short session, e.g., recent advances in the diagnosis and treatment of anemias.

Quite a few of the physicians in this study had tried to learn electrocardiographic interpretation, as an example, through attendance at seminars

or short courses. Most of them had been brought to a stage of confused acquaintance with the subject. Lectures clearly cannot substitute for supervised experience in learning electrocardiography and many other specialized techniques. Suitable opportunities to master special skills would appear to be important to help physicians broaden the effective scope of their practices.

During the course of this study it was found that quite a few of the medical societies attempted to provide speakers and leaders of clinical discussions from among their own membership. No systematic attempt was made to catalogue opinions as to the success of these laudable ventures but the physicians were often dissatisfied with what were described as "only local speakers." Several doctors stated that it was their policy to attend only those medical meetings at which a speaker came from a medical school.

Contact with colleagues is often mentioned as an important educational medium. It was the impression of the observers that contacts between doctors did not usually involve medical problems; discussions concerned fishing, social life, or almost anything except medicine. This will be mentioned further in a succeeding chapter.

DISCUSSION

The virtues of refresher courses or other types of postgraduate study have been so generally assumed that it is with some hesitancy that their value is now questioned. The data which have been presented do not show that postgraduate education as conducted at present influences practices greatly. In Table 19 it was shown that the very best doctors did the most postgraduate work and the poorest, the least. The ranges were great and the variation in means small and not significant. One interesting observation which appeared from this tabulation was that there appeared to be a moderate amount of study that was characteristic of good doctors. That is, there were significantly more of the superior physicians doing 40 to 60 hours of postgraduate study than there were doing either larger or smaller amounts. This would tend to suggest that doctors who do more than 60 hours of postgraduate study annually may be doing more than is necessary for their purposes, or that interest in medicine or study may not be their primary motivation in attending medical meetings.

The association of postgraduate study with age is at variance with other studies. Doctors in the fifth decade of life showed the greatest attendance at postgraduate sessions. This may be due to a combination of circumstances. This is a time when the doctor's income is high and has been high for some time so that the cost of postgraduate education may be less of a problem. By the fifth decade the doctor has been out of medical school sufficiently long so that the need for refresher training may be felt to a greater extent than in his earlier years. The fact that very young doctors did considerably less postgraduate study may be due to the heavy demands of practice, smaller economic resources and possibly less need for vacations from practice. Among the physicians in the sixth and seventh decade, many were found to be making deliberate efforts to reduce the size of their practices. In the oldest age groups it is to be expected that the physician's atten-

tion to postgraduate study might be less. The fact that medical school and internship and residency training had so little influence on postgraduate study habits runs counter to usual beliefs.

The size of the community where the doctor practiced was related to his postgraduate study habits. The largest amounts were undertaken by doctors in towns with a population between 1,000 and 2,500 and in large cities with population over 50,000. It is a point of some interest that the isolation of the rural physician is not universal or complete as is evidenced by the fact that some small town doctors were among the most frequent attenders at postgraduate meetings. The rather active attendance at meetings which is characteristic of doctors in towns of 1,000 to 2,500 was in marked contrast to those in towns of less than 1,000.

Doctors who did no "formal" postgraduate study were on average qualitatively a different group than doctors who did "formal" postgraduate study. The fact that increasing amounts of formal postgraduate study were not associated with an increase in the quality of the doctor's work would strongly suggest that a breakdown on this basis has resulted in a selection of two types of men. It cannot be denied that postgraduate education may have a favorable effect on the doctor's practice but such an assumption could be held with greater certitude if increasing amounts of formal postgraduate education were accompanied by better performance.

Observations made in the course of attending clinical meetings have been referred to above. A recent article by Ellis embodies many of the criticisms of continuing medical education which the present authors hold.[1]

B. Medical Journals

The general practitioner, like other physicians confronted with a changing body of knowledge, has the vexing problem of "keeping up" with the medical literature. In this section, his success in this arduous task will be considered.

METHODS OF STUDY

Each doctor was queried as to the number of journals which he purchased. The doctors' unsolicited comments about the various journals were recorded in a large number of instances. All of the studies which will be presented below with respect to the doctors' reading and study habits have been phrased in terms of "journal purchases." Though an attempt was made to determine the doctors' reading habits, this was estimated at best and often patently inaccurate, so it was felt that nothing would be contributed by using these observations. The number of journals purchased, on the other hand, is probably an accurate figure. This convention has, of course, involved the assumption that doctors who purchase more journals do more reading. In general, this is felt to be true.

1. Ellis, L. B.: *New England J. Med., 250:* 243-246 (1954)

RESULTS

Number and journals purchased

The distribution of physicians by the number of journals purchased is shown in Table 21. The variation in this characteristic is as great as other aspects of practice examined. It will be noted that the mode is purchase of four journals. The average is 4.09 per physician.

TABLE 21

Distribution of Physicians by Journals Purchased

No. of Journals	No. of Physicians
1	4
2	14
3	20
4	32
5 - 6	16
7 - 15	7
Total	93

The number and variety of journals taken by the group of general practitioners in this sample was remarkably diverse. In the accompanying list the frequency with which various journals were purchased or received is shown.

Journal	*Number Purchasing*
J. Am. Med. Assn.	85
North Carolina M. J.	78
GP	35
M. Clin. North America	35
South. M. J.	20
Postgrad. Med.	19
M. Times	15
S. Clin. North America	9
Am. Practitioner	6
J. Pediat.	6
Ann. Int. Med.	5
Arch Int. Med.	5
Tri-State Med. J.	5
J. Internat. Coll. Surg.	4
Obst. Gyn.	4
Am. J. Dis. Child.	3
Medicine	3
So. Gen. Prac. Med. Surg.	3
Geriatrics	3
Am. J. Med.	3
Surg. Gyn. Obst.	3
Ped. Clin. North America	2
Lancet	2
Ann. Surg.	2

In addition to the 24 journals listed, there were another 21, each of which was received by a single doctor. Included in the latter category were the following: Eye, Ear, Nose, Throat Mon.; J. Clin. Path.; Practitioner; Quart. Rev. Surg., Gyn., & Obst.; Virginia M. Month; Year Book Ob. Gyn.; GP. Clin. North America; Indust. Med. & Surg.; J. Clin. Endrocrinol.; Proc. Staff Meet. Mayo Clin.; Bull M. Hague Hosp.; Gastroenterology; Diabetes; World Med. J.; J. Bowman Gray Sch. Med.; Am. J. Roentgenol.; New England J. Med.; Am. J. Obst. & Gyn.; Surgery; South Carolina M.J.; and Am. Heart J.

The general purchase of the *Journal of the American Medical Association* and the *North Carolina Medical Journal* is understandable. The *North Carolina Medical Journal* is provided with membership in the Society and in the past this was also true of the *Journal of the American Medical Association*. Other commonly purchased journals such as *GP*, and *South, M.J.* are also given with society membership and in some instances this may

contribute to their apparent popularity. Some among the more popular journals are clearly designed for the professional needs of the general practitioner. Among all practitioners the purchase of specialty or more technical journals increases as the number of journals to which the doctor subscribes increases.

Influence of place of practice on journal purchases

In Table 22 the journal purchase habits of the doctors have been compared with the population of practice site. In the previous section it was demonstrated that in terms of postgraduate education the isolation of rural physicians was no greater than that of their urban counterparts. In the matter of journals this again appears to be true. On an average rural practitioners purchased 4.7 journals compared with 3.7 journals purchased by their urban colleagues. The further breakdown by population presented in Table 22 shows that doctors in the smallest towns purchased the fewest journals, whereas those in towns of 1,000 to 2,500 purchased more than any other single group. With increasing population of the site of urban practice the number of journals diminished. This may be related to the fact that larger cities have more extensive hospital facilities and correspondingly more extensive medical library facilities. As with most characteristics, the individual variation was great. While the variation in means is significant, the tabulations shown have little predictive value for the individual physician.

TABLE 22

Distribution of Doctors by Number of Journals Purchased and by Population of Place of Practice

Population of Place of Practice	No. Doctors	Average No. Journals
Less than 1,000	12	2.7
1,000 - 2,499	21	5.8
2,500 - 9,999	30	4.1
10,000 - 49,999	21	3.4
50,000 and over	9	3.3
	93	

Effect of income on journals purchased

The number of journals purchased varied directly and consistently with the doctor's income. For example, doctors with net incomes below $5,000 averaged 2.6 journals. With a single exception, increases in income were accompanied by an increase in the average number of journals purchased. Among the doctors with net incomes in excess of $30,000 per annum the average was 8.4, over three times as many as the average number purchased by the lowest income group. Since it will be shown that income and the quality of a physician's work show no association, it appears that the physician's journal purchase habits are related to or affected by more than one

TABLE 23

Number of Journals Purchased in Relation to Age of Doctors

Age Group	No. Doctors	Mean No. Journals Purchased
Under 30	5	4.5
30 - 39	34	4.2
40 - 49	27	4.6
50 - 59	21	3.6
60 & over	6	2.3

observable characteristic of practice. As with other characteristics, these averages are based on wide ranges.

Physician's age and journal purchases

In the previous section it was shown that postgraduate study habits of general practitioners varied considerably with age. In Table 23 a similar comparison has been made with the journal purchase habits of the general practitioners. Whereas in the first comparison it was found that the youngest and the oldest practitioners did less postgraduate study, in the case of the journals it is found that there are no essential differences in journal purchases until the sixth decade is reached when the number begins to decline and appears to do so steadily thereafter. The consistency of these results leaves little doubt as to their reality.

Medical education and training and journals purchased

The qualities which make for a successful student might be reflected in a more studious doctor. Therefore, in Table 24 a comparison has been made between the doctor's medical school rank and the purchase of journals as a practitioner. It can be seen from the averages presented in the right hand column that there is indeed a small progression in the journal purchase habits of doctors from the lowest to the top third of the medical class. While the rate of increment shows a linear trend, the differences are small and would not seem to be of great practical importance.

TABLE 24

Number of Journals Purchased in Relation to Doctor's Rank in Medical School

Medical School Rank	No. Doctors	Mean No. Journals Purchased
Lowest third	28	3.9
Middle third	42	4.1
Top third	19	4.4

An attempt has been made to compare training and the doctor's habits with regard to the purchase of journals. It is reasoned that the length and the quality of the internship should contribute to the doctor's reading and study habits. However, in comparing the length of training and journal purchases, no association was found. Several further examinations failed to indicate that the quality of training influenced journal purchases detectably. Medical internship, which has previously been shown to have a marked association with the quality of a doctor's work, has no identifiable effect upon journal purchase habits.

Quality of physician's work and journal purchases

A most important fact about journals is their relation to the quality of the doctor's work. This has been examined in Table 25. Unlike postgraduate education in which increasing amounts did not definitely distinguish better doctors, journal purchases seem to vary, on an average, directly with the qualitative assessments which have been made. The regular increase in the mean number of journals purchased with better quality of work leaves little doubt of the significance and importance of the association. Postgraduate study often takes the doctor away from his practice and may provide at least a change, if not a vacation, whereas the purchase of journals represents an outlay of money whose main return to the doctor will be in increased education. The better doctors characteristically appeared interested in medicine and in their patients. They also exhibited a curiosity about the meaning of their patients' complaints and signs, which would be expected to be associated with studious habits. However, some very good physicians purchased very few journals and some poorer physicians purchased many, so the trend found again is of little value in predicting individual performance.

TABLE 25

Distribution of Doctors by Quality of Work and Number of Journals Purchased

Qualitative Rank	No. of Journals				Average No. Journals
	1-2	3	4	5 & over	
V	0	3	2	2	5.7
IV	2	3	4	6	5.1
III	3	5	10	9	4.2
II	5	5	9	4	3.8
I	6	3	6	1	3.1

Relation of postgraduate study to journal purchases

Attending meetings and reading journals are the main resources, apart from individual experience, upon which the practicing physician must depend in maintaining and augmenting his clinical skill. A comparison between the doctor's postgraduate study habits and the journals purchased is presented in Table 26. It can be seen that the average number of journals

TABLE 26

Relationship Between Postgraduate Study and Number of Journals Purchased

Postgraduate Study in Hours	No. Doctors	Average No. of Journals
60 & over	15	4.2
40 - 59	24	5.5
20 - 39	24	4.0
0 - 19	30	3.0

purchased increases as the doctor's study time increases up to 60 hours per year. Above this level there is no further increase in the purchase of journals. The range in the number of journals purchased increases as the number of hours of postgraduate study increases. This means that the opportunity for individual variation increases as the doctor devotes more time to his continued education.

Physicians' comments on journals

The doctors' comments on their satisfaction or dissatisfaction with medical journals were illuminating. No special attempt was made to collect opinions but a number of doctors volunteered them and since they are of interest and potentially important they will be mentioned here. Some doctors, though they purchased the *Journal of the American Medical Association,* were dissatisfied with it. One of the most common reasons given is that this journal is too "theoretical." Some doctors stated that its subject matter is too diverse and that many of the articles are not germane to general practice. Specialty publications such as the *Annals of Internal Medicine* were occasionally criticized in the same vein. Among the doctors who commented on their likes and dislikes of journals, it was found that *Medical Clinics of North America, Postgraduate Medicine* and *GP* were most frequently commended, with mention being made of the *American Practitioner,* the *General Practitioner,* the *Journal of General Practice* and the *Medical Times.* Comments about these journals were usually to the effect that they provided information of a type and form which the practitioner needed in contradistinction to the too "theoretical," "scientific" character of some other publications.

The digests

In addition to the journals mentioned above, all doctors received a number of free digests or pocket-size magazines. These appear to be read to a variable extent. *Modern Medicine* and *Medical Economics* are two periodicals in this class which commanded the doctor's attention more than others. One or two doctors stated that they had obtained information from *Medical Economics* which had been useful in their own practices. One would judge by the remarks of the doctors that cartoons and jokes in both journals are quite generally read.

DISCUSSION

The reasons for the general practitioner's impatience with the theoretical aspects of medicine are to be found in his work. Practice is the application of medicine and not an intellectual steeplechase to an overwhelming majority of practicing physicians. Scientific literature that is not of direct application or use then seems to them a waste of time. The time which the general physician has for rest, study and recreation is necessarily limited and often interrupted and it is to be expected that there will be real limitations on the amount of reading of a professional nature which he is able to do. It is not surprising, therefore, that the general practitioner often becomes impatient with theory or the details of methods of study, the statistical minutiae, the conclusions with the many reservations, the negative conclusion or the characteristic hedging which are all part of every scientific article.

In another chapter it will be shown that the younger physicians, who on average purchase the largest number of journals, are the busiest. The possibility exists that these early years of long, hard work days undo study habits formed in medical school. As the doctor's work diminishes with advancing years it is probably difficult to resume the regular reading and study that may have been crowded out of his schedule. Despite the many deterrents to study encountered in the early years of practice, it is notable that many physicians do not neglect it. It is necessary to come back repeatedly to the point that interested individuals can accomplish the difficult in the face of odds that will defeat many others.

The practicing physician's need for authoritative information is well illustrated by the spate of new medications constantly being offered to him. Some of these are active, some are worthless, some are harmless, while others ultimately prove to be very dangerous. First reports of serious toxicity from commonly used drugs fortunately usually appear in the *Journal of the American Medical Association*. Occasionally these reports appear elsewhere, in journals which the general practitioner does not commonly read. The introduction of each new medication is accompanied by a mass of literature which descends upon the physician's desk each day showing him the presumptive virtues and excellence of each. The practicing physician cannot know everything about therapy nor evaluate the very optimistic claims made for the many medications pressed upon him. A good conscientious doctor may easily fail to keep up with the vital new knowledge in medicine. Authoritative information about many of these common procedures or medications, furnished in a concise form to the general practitioners, would provide a great service. This is a function which state universities with their characteristic service relations to the practicing physicians of their state might well undertake.

This section was introduced by a quotation of one of the objectives of medical education related to habits of study. It appears from the imperfect measures used that medical education is only partially successful in inculcating "essential habits of study" in its graduates. This is not because the

aim is wrong, but because the situation of practice is so different that the habits of study expected in a medical center may not be realistic in the press of practice. The fact that a few doctors gave evidence, by the journals they purchase, that they are interested in the theory of medicine does not mean that all can be made to have the same interest though it does show that a busy practice is not incompatible with good study habits. It is for this reason that the regular provision of authoritative information for the practitioner is suggested.

C. Medical Society Membership

No discussion of general practice would be complete without mention of medical society membership. Membership and activity in the medical societies are generally regarded as a favorable sign of the doctor's interest in medicine. Medical societies fulfill various functions and hence attract varying memberships. The American Medical Association and its constituent state, district and county societies represent "organized medicine" and provide the administration and organization for which the practicing physician normally has so little time himself. The Academy of General Practice and other societies with their different purposes attract a different and selected membership. In the following pages some factors thought to be related to membership in professional organizations and their possible effects on the physician's practice are examined.

METHODS OF STUDY

Each doctor's membership in the medical societies was recorded. In the section on postgraduate educational activities, some estimate of the doctor's attendance at medical society meetings and other educational ventures which may be related to medical society membership have been discussed and will not be repeated here.

RESULTS

Frequency of medical society memberships

Among the 94 doctors who participated in this study information about membership was obtained from 93. Among these 93 doctors a total of almost 400 memberships in medical societies was found.

About 80 per cent of the doctors belonged to three to five medical societies with an over-all average of 4.2 societies per physician. It might be noted that among doctors there were only four who did not have membership in the American Medical Association. There were 58 doctors who had membership in organizations other than the county, state, or American Medical Association. Membership in a considerable number of instances was in interstate societies or the Southern Medical Association or in other geographically defined organizations. Thirty doctors were members of the American Academy of General Practice. In a few instances memberships were held in highly technical scientific organizations.

Place of practice and medical society membership

The fact that rural physicians suffer no greater isolation than urban physicians in terms of continuing medical education has been mentioned elsewhere. Membership in medical societies supports this observation. Rural physicians on an average belong to more medical societies (4.2) than those practicing in urban communities (4.1), but the differences are not great and certainly are of no practical importance. The doctors practicing in places with a population of less than 1,000 are different from all other doctors in this respect. On an average these doctors belong to just over three organizations, compared with an average of over four among all general practitioners. Physicians practicing in towns with a population of 1,000–2,500 belong to more medical societies and organizations (average 4.7) than doctors practicing in any other population aggregate.

Effect of age on medical society membership

Membership in medical societies appears to be related to the age of the doctor. Membership was low among doctors in the third decade of life (average 3.6), rose in the fourth decade until a maximum was reached in the fifth decade (average 4.8), and thereafter fell off steadily. In this respect membership in societies closely parallels attendance at postgraduate sessions to which it probably is closely related. Possible reasons for this have been discussed in the section dealing with postgraduate study.

Medical society membership and the quality of the physician's work

It seems to be widely held that membership in the medical society is related to the quality of the doctor's work. It is thought that it increases his attendance at clinical scientific sessions and his contacts with other doctors and generally provides the stimulus to better practice which is assumed to follow from these activities. The result of examining these two items for an association was completely negative. It would appear that there is no relationship between the quality of a doctor's work and the number of medical societies to which he belongs.

Since the overwhelming bulk of doctors belong to the county, state and the American Medical Association, membership in these organizations cannot be very discriminating. Accordingly, the quality of the physician's work was compared with membership in societies other than the county, district, state, or the American Medical Association. The comparison of the quality of work done with membership in these other societies revealed no relationship.

Membership in the Academy of General Practice entails study obligations which are nearly unique and hence it deserves separate consideration. The fact of membership or nonmembership in the Academy of General Practice was compared with the quality of work being done by the individual physicians. It was found that among the 30 members of the society there was a tendency towards inclusion of the better physicians as compared with the over-all average. Since the Academy of General Practice has been in existence for only a short time, the most reasonable assumption is that

superior quality of its members is not due to the educational requirements which it imposes but rather to self selection by its members. In addition to the 30 members of the Academy there were six younger physicians who had not been in practice sufficiently long for membership but who indicated their intention of joining when eligible. Among this group there was a distinct concentration of better physicians. The difference between the Academy and non-Academy members was not great.

Miscellaneous observations on medical society memberships

A larger net income is associated with an increased number of medical society memberships. There does not appear to be any constant relation between medical activities as measured by society membership and the doctor's business as measured by the length of the doctor's work day. The very busy, on an average, join few societies. Doctors with very small work loads tend to join somewhat more, while the doctors carrying a moderately heavy load of work (9-11 hours per day) join medical organizations most frequently.

DISCUSSION

Membership in medical societies together with attendance at clinical scientific sessions is generally regarded as evidence of a doctor's interest and activity in maintaining his skills and the level of his practice. Interest in medicine cannot be measured but the related quality of practice can be. It appears from the comparisons made that medical society membership exerts very little influence on quality of practice. Society membership appears to be related to the age of the doctor. The younger doctors in general belong to rather few medical societies, but with increasing age, physicians join more. Towards the end of his career, a doctor's interest in maintaining membership in medical societies diminishes.

One of the facts of some interest that emerges in the examination of the societies to which general practitioners belong is the considerable number of these organizations that are available. One can only conjecture as to the reason for the multiplicity of societies. Their existence and membership may possibly be an expression of the physicians' uneasiness with respect to study and "keeping up." The Academy of General Practice in which membership entails considerable obligations as to study is unique. To belong to it the physician not only has to pay dues but also has to attend a fairly heavy schedule of postgraduate sessions and meetings. As might be expected, the membership of this organization has to some extent been selected from better physicians than the generality of general practitioners.

VI: The Doctor and the Medical Community

A. The Physician's Relationship With the Hospital

NORMALLY THE PRACTICE of medicine—even solo practice—is not carried on in isolation. Most general practitioners have hospital appointments. Most refer patients to specialists. There are contacts with the health department, colleagues, and drug salesmen. To what extent do these contacts and facilities aid the practitioners or provide opportunities for case discussion? It is popularly believed, for example, that the hospital is very important as an instrument for continuous education, but is this so? In the following sections the effects of hospitals and consultants on the physician's work will be examined.

METHODS OF STUDY

Information was sought concerning appointments in hospitals in which the physician had been given the privilege of caring for patients on his own responsibility. In addition, an effort was made to determine how actively each physician exercised these privileges for purposes of patient care or improving his own professional skills.

For the purpose of this discussion, the salient point was whether the physician was permitted to admit patients to the hospital and assume responsibility for the care of these patients. No attempt was made to distinguish between physicians on the basis of restrictions imposed on them by any one of the hospital services; similarly, no distinctions have been made on the basis of type of appointment held, such as "active member," "courtesy member," or other.

Information concerning hospital staff appointments was, of course, easily obtained by asking the physician to enumerate them. However, the decision concerning how actively the physician exercised these privileges was not so readily made. Active interest in a hospital staff appointment was defined as taking care of patients in a hospital, holding some elective or appointive post on the staff of a hospital, or exhibiting other specific evidence of active participation in the professional life of a hospital. Using these criteria, a physician could be designated as either "active," indicating that he utilized and maintained an active interest in a hospital or as "inactive" indicating that he either had no appointment or that he did not actively exercise the privileges granted him by the hospital.

RESULTS

Distribution of hospital appointments

Of the total 94 physicians visited, 10 were found to be without hospital connections of any type. Of these 10, two were full-time industrial physicians who considered care of hospitalized patients beyond their scope. Two other physicians had been active in their local hospital until it was destroyed by fire and they expected to resume hospital practice upon completion of a new plant. The remaining six physicians expressed no desire for appointment to a hospital staff; for various reasons, most of them had declined appointments when offered. In other words, no physician had been involuntarily excluded from all hospitals; all who desired an appointment were successful in procuring one in at least one hospital. A very few had been excluded from some hospitals while others were restricted from doing surgery or operative obstetrics without supervision. In addition to the 10 doctors who had no hospital appointments, there were seven other physicians who had appointments in one or more hospitals but did not exercise their privileges. In all, a total of 17 physicians were designated as "inactive."

Twelve physicians exercised their hospital privileges only in caring for obstetrical patients. These doctors referred other patients requiring hospitalization to colleagues. Seven physicians maintained one or more beds, either in their offices or small adjoining clinics, for obstetrical deliveries. Four of the seven physicians who maintained obstetrical beds also maintained an active association with the staff of one or more hospitals.

Influence of distance on hospital activity

Distance from a hospital is recognized as a valid reason for lack of active participation in and utilization of the services available. Table 27 shows the distance from the nearest hospital for each of the 94 physicians and also indicates which of these physicians maintained an active interest in the hospital.

Ninety per cent of doctors practicing within six miles of a hospital were actively using it. Eighty per cent of those six to 15 miles away used the hospital, while only 40 per cent of those beyond 15 miles maintained an active association. A physician is less apt to avail himself of hospital privileges if the hospital is located at some distance from his practice. It

TABLE 27

Relationship Between Distance from Hospital and Use of Hospital

Distance from Nearest Hospital	Total No. of Doctors	No. Who Actively Use Hospital	Per Cent
Under 6 miles	62	56	90
6 - 10 miles	9	7	78
11 - 15 miles	11	9	82
Over 15 miles	12	5	42

would appear that most physicians do not maintain active hospital associations beyond a radius of 15 miles from their practices.

Relation of physician's age and practice location to hospital activity

The mean age of 17 "inactive" physicians did not differ significantly from the mean age of the "active" physicians. An unusual concentration of the "inactive" physicians were practicing in towns with population under 1,000. Obviously, this finding must be largely determined by the fact that hospitals are usually located in larger population centers.

Relation of physician's training to hospital activity

Physicians who have spent longer time in hospital training as interns and residents might, because of greater familiarity with the services obtainable in a hospital, utilize these services more. This appears to be the case among the general practitioners studied. On the average, the "active" physicians had spent more time in internship and residency, but the difference was not statistically significant.

Qualitative rank of "active" physicians

The assumption has been made that a physician with an active hospital affiliation may be expected to render a higher quality of care to his patients. Certainly, the effectiveness and the completeness of the care which he can provide should be increased by the use of hospital facilities. However, comparison of the mean qualitative ranks for the "active" and "inactive" doctors revealed no difference. There were good doctors and poor doctors practicing without hospital connections. Physicians maintaining active staff appointments did, however, obtain a somewhat higher score for the use of laboratory aids to diagnosis. This points out the fact that a physician will make use of some hospital services which he cannot, or will not, provide himself; however, this alone does not raise the over-all standards of his practice.

Hospitals vary just as much in standards as they do in number of beds. The number of clinical meetings held is also variable and frequently meagre. An attempt was made to learn if the hospitals that had very active educational programs were affecting their member's practices. Although there was a suggestion of an effect the study methods were not of such a nature that any sound opinion can be expressed about this point.

Use of hospital facilities

In each practice notes were made relative to the patients admitted to the hospital and the diagnostic measures employed by the physician. The variation in number and type of patients hospitalized made judgments impossible. It appears that a physician provided medical care of the same quality regardless of whether the patient was visited in the hospital, home or office. It was apparent that some doctors did not fully understand the advantages and limitations of hospital care. For instance, patients with apparently mild diseases were hospitalized by some physicians for a "work-up." Frequently, this "work-up" consisted of little more than what had

already been accomplished in the doctor's office—the same history and physical examination plus, perhaps, a complete blood count and an X-ray of the chest. Some doctors quite regularly performed laboratory tests only on hospitalized patients. This may have contributed to the higher score on use of the laboratory which the "active" physicians received. The better doctors fully understood how to use the hospital. Their patient care in the hospital was excellent and they used hospital services skillfully to broaden the scope of the care given.

DISCUSSION

The most important observation is that physicians who maintain active hospital staff associations do not render a higher grade of medical care to their patients than do their colleagues without such affiliations. Certainly physicians who utilize the greater facilities and services of a hospital can provide a wider scope of medical care for their patients; however, this apparently does not alter the quality of such care. Perhaps it is unrealistic to expect that availability of services and equipment alone will influence the level of a physician's practice. The presence in the hospital or community of a large, well equipped clinical laboratory capable of making extensive biological tests does not provide any effective mechanism to help the individual physician take a better history or make a more thorough physical examination.

On the other hand, the community hospital may provide the physician with the opportunity for more and closer contact with his colleagues and thus facilitate mutual exchange of ideas. In some communities it was quite apparent that the community hospital was the focal point of a continuing education program. In other localities the hospital was considered largely as a nursing home to house patients who could not be cared for conveniently in their own homes. Where such an attitude is prevalent in the community, the hospital is not likely to attain full stature as an institution for the skilled medical care of the ill and as the center for professional activities. It seems most likely that the physicians and the citizens of a community determine the level of care which will be extended by their hospital rather than that the hospital specifically influences the level of care rendered by the physicians comprising its staff.

A second important fact is that there appears to be little basis for any complaint on the part of North Carolina general practitioners that they have been crowded out of hospitals by specialists. Some physicians were not allowed the full range of hospital practice which they may have desired, but in no instance did a physician state that he had been unable to obtain any hospital staff appointment. Some of the physicians without active staff appointments stated that they had no desire to care for hospitalized patients because they felt it would make too great a demand on their time. In some instances where the physician practiced at a considerable distance from the hospital this was certainly a valid reason. In other cases it was difficult to understand why the physician chose not to avail himself of the hospital facilities. In one or two instances it was apparent that the

policies influencing the running of the hospital had caused a physician to refuse to participate in the hospital activities. The reasons why some physicians used the hospital only for obstetrical patients were not clear in all instances. Only two of these physicians restricted their practices to obstetrics. Some seemed to feel that obstetrical care was the time-honored province of the family physician and general practitioner and that they had to fulfill this expected role.

The matter of spatial relationship to the hospital seems to be an important one. Surely the physician who has to spend a large amount of his time every day traveling to and from the hospital is not performing at maximum efficiency, although quite a few of the doctors in this study bore this added burden without complaint.

B. Type of Practice

The results of this study indicate that the term "general practice" means many things to many people with few agreeing on a single definition. At the inception of this work it was necessary to select criteria which would distinguish the general practitioner from his specialist colleagues. In choosing the criteria to be used, greatest emphasis was placed on the amount of training each doctor had received after graduation from medical school. It was found, as expected, that physicians with relatively little training were usually engaged in practice that was wide and general in scope. Using educational criteria had the effect of casting a rather wide net which inevitably encompassed physicians engaged in diverse practices, some of which were highly specialized. The variation in the scope of practices was soon apparent. It was also quickly apparent that the type of practice bore a positive relationship to many variables. Some analyses were made in order to define and illustrate these relationships.

METHODS AND RESULTS

For the most part the practices which were visited could readily be divided into three groups. The following list defines these groups and enumerates the number of practices contained within each group:

Type I — The scope of these practices was limited to general medicine for men, women and children, plus, in most instances, minor office surgery.....17

Type II — These practices extended the scope of Type I to include obstetrics in addition to medicine for men, women and children.....61

Type III — These practices included all the features of the first two types and added major operative surgery.....11

There were five practices which did not conform to any of these three types; in three instances the practice was limited almost solely to obstetrics and in the other two instances it was limited to industrial medicine.

Physicians were divided into two groups on the basis of whether they performed any of the roentgenologic studies incident to their practices. There were 50 physicians doing X-ray work. Some physicians owned and used only the fluoroscope, while others attempted no fluoroscopy and relied entirely on films. A few physicians used both techniques. Very few physicians in this group did any real volume of roentgenographic work and many used their machines rarely. Only three attempted X-ray therapy.

TABLE 28

Relation of Scope of Practice to Physician's Age

Type of Practice	Mean Age (Years)
I	48.9
II	41.7
III	41.8

The principal significance of this finding lies in the fact that more than half of this sample of general practitioners attempted to carry out specialized procedures involving the use of X-rays.

Physician's age and scope of practice

The average age of physicians in Type I practice is significantly higher than the age of physicians engaging in Type II or III practices (P = less than 0.01). This is shown in Table 28.

This may be a function of several factors. Since this study was a cross-sectional one, it is not known in all cases whether a physician's practice differed significantly at the time of study from earlier years. However, several physicians did state that they had stopped doing obstetrics because of its irregular time demands and their own advancing age. Some physicians had also ceased performing major surgery because of increasing age or for other reasons. Another factor which probably has operated to restrict the scope of practice of some of the older physicians is the spate of new hospitals and the specialized staffs which they have attracted. The result has often been restrictions on practice of surgery and obstetrics by general practitioners. Some of the physicians with the limited Type I practices never included surgery or obstetrics in their practices; these physicians had restricted themselves voluntarily from the very beginning.

Scope of practice and community size

There appears to be a decided relationship between community size and scope of practice. This is shown in Table 29. Although scope of practice was directly related to the physician's age and to the population of the location of the practice, there was no discernible relationship between the physician's age and the population of practice location. The

TABLE 29

Relation of Scope of Practice to Population of Practice Location

Type of Practice	Population Group					
	Less than 1,000	1,000-2,499	2,500-9,999	10,000-49,999	50,000 and over	Totals
Type I	1	2	3	7	4	17
Type II	11	14	21	12	3	61
Type III	none	6	4	1	none	11

relatively limited Type I practices tended to be found more frequently in the more populous areas where the number of physicians in practice was also greater. On the other hand, Type II and III practices covering broader fields of medicine, obstetrics and surgery, were more numerous in the medium to small communities. This may indicate that physicians wishing to limit their practice had chosen larger communities where ancillary specialist help is available or that medical organization and hospital restrictions on nonspecialists had operated to produce involuntary restrictions on these practices. Both factors are real and undoubtedly play a role of varying magnitude in different communities. In the case of physicians doing major surgery, none was found in either the very smallest or the very largest communities. The former frequently lack the hospital facilities necessary for surgery while in the latter hospital restrictions probably preclude the performance of surgery by general practitioners with little formal training. A few physicians stated that their practices had been curtailed in recent years in either amount or scope by the influx of specialists or by hospital restrictions. These changes were not universally resented; several physicians expressed gratitude for local availability of specialized knowledge and skills for which they previously had been forced to send patients long distances to neighboring cities.

Scope of practice and quality of medical care

The scope of a physician's practice did not appear to influence significantly the quality of medical care which he provided. Although physicians performing major surgery in addition to obstetrics and general medicine were judged on the average to be slightly better doctors, the difference was small and was not of statistical significance.

Effects of group practice

For the purposes of this discussion the term "group practice" was defined to indicate any practice comprising two or more physicians regardless of the type of organization involved. The organizational units included under this term ranged from a simple association between two general practitioners who occupied common office and laboratory space and provided occasional coverage for one another on nights and week-ends, to highly organized groups of physicians practicing various specialties and owning a hospital. Twenty-four practices fell under this broad definition of group practice.

Probably the most important differences between physicians practicing alone and those practicing with one or more associates were found in three areas. The mean qualitative rank of the group practitioners was 3.4 as compared with 2.5 for the solo practitioners. This difference is statistically significant (P = less than 1%). On the average, the group practitioners also compiled better academic records while in medical school than did the solo practitioners. Again the difference is statistically significant (P = less than 5%). The third important finding was that the group practitioners had spent a longer period of their time during internship and residency

training on the internal medicine service. The group practitioners averaged 6.3 months on the medical service while the solo practitioners averaged 3.7 months. This difference is statistically significant (P = less than 5%).

It was also found that physicians practicing in groups or associations purchased significantly more medical journals than did their colleagues in solo practice. Group practitioners were slightly younger and worked slightly longer hours per day than did the solo practitioners but these differences were not significant. More laboratory equipment was found in the offices of the group practitioners but the difference was not significant. However, significantly more of the group practitioners had direct access to the services of a trained medical technologist. The only statistically significant difference between these two types of practitioners with regard to the scope of practice was that a larger number of group practitioners were engaged in practice of the widest scope including general medicine, obstetrics and major operative surgery. In examining the size of the community in which these doctors were located it was found that no group practitioners were practicing in communities with a population of less than 1,000. For the most part they were congregated in towns having between 1,000 and 10,000 population. It is also noteworthy that the group practitioners earned a higher income than did physicians in solo practice. The difference was statistically significant (P = less than 1%). Solo practitioners performed as much postgraduate study, both formal and informal, as did the group practitioners.

These findings appear to indicate that the group practice arrangement does provide a favorable environment for the practice of medicine. However, these data do not provide conclusive information as to whether the better physician creates for himself the favorable arrangement of group practice or whether this favorable arrangement influences the physician to be a better one. It would appear most probable that the former explanation obtains. It seems likely that the better physician recognizes the advantages of the group practice arrangement and sets out to provide himself with these advantages in order to render a higher quality of medical care to his patients.

C. Use of Consultants

It would be of interest and importance to assess the effect of the specialist on general practice. It is widely believed that the practitioners' contacts with his specialist colleagues may be important educationally. The problem of examining the relationship of the general practitioner to the consultant was undertaken, but no wholly satisfactory method for its solution could be devised within the limits of this study. Some of the material which was collected is interesting and informative although it does not provide any means of assaying the overall effect.

Physicians were asked for the location of the consultants which they commonly used and their reasons for choosing these men. In addition, a general estimate of the frequency of such use was made by the observers, and a few examples of referrals were recorded. In order to provide an

ideal assessment of this situation, one would have to know, among other things, the exact type of patient referred, the ability of the consultant, the rate of referral and the use the referring physician made of the information supplied by the consultant. Such data could not be collected.

Most consultants were chosen on the basis of proximity and the practitioner's estimate of competence. Quite naturally, the popularity of a consultant was frequently a function of the assiduity with which he returned patients to the referring physician after the consultation, and also the promptness with which he informed the referring physician of his findings. Some physicians did not use local consultants at all, preferring to send their problems to a physician in a larger city or medical center. Some such referrals appeared to be dictated more by pride than thoughtfulness. Clearly, many other factors such as friendships, considerate handling of the patient and the referring physician, allegiance to institutions, and quality of the consultant's efforts influenced the decisions as to which ones to employ. Some physicians referred certain types of patients with much greater alacrity than others and this naturally influenced the pattern.

Some general practitioners made extensive use of specialists not only for the handling of surgical patients but also for help with the more obscure medical and pediatric problems which they encountered. In the poorer practices where it was frequently impossible for the observer to determine, on the basis of the history taken by the doctor, in what area the patient's problem lay, it was also impossible for the observer to make any estimate as to the need for consultation. Some of the less adept physicians relied heavily on their specialist colleagues, thus partly covering their own inadequacies. This was far from common, however.

A few physicians hospitalized patients with only certain types of problems, preferring to refer others to their specialist or general practitioner colleagues for care. As was mentioned above, some doctors took advantage of their hospital staff appointments only for obstetrical deliveries; patients with medical diseases were treated in the home or office but not in the hospital. This was a voluntary restriction on practice and was more a shifting of work than a consultation. The reasons for such restrictions were variable and not always clear although they did not usually result from hospital regulations. Since most general practitioners do no major surgery, referral for this purpose is common.

In a few of the group practices frequent and extensive consultations between members of the group were observed. In one, for example, daily ward rounds were held at which time patient problems were discussed and decisions made about their management. In another mixed general practitioner-specialist group, frequent informal opinions were obtained from the surgeon and radiologist members. Interpretations of X-ray films by a specialist were obtained to a variable degree by physicians performing roentgenologic studies in their offices. A very few doctors referred all films for interpretation while others sought help in interpreting "questionable" films or chest films.

This study produced only impressions concerning the over-all relation-

ship existing between the general practitioner and the specialist. However, the inference seems warranted that, in general, specialists are not utilized in a great many situations in which they could be of real value to the patient. Although continuing education of the general practitioner through the medium of consultation with a specialist is secondary to the patients' interests, this remains a device of great potential worth which does not appear to be fully utilized by specialist or general practitioner.

D. The Drug Salesmen

During the course of this study, the authors were often asked if the detail men did not probably provide some continuing education for general practitioners. This is not a difficult question to answer since the detail man's function is not to provide education but to sell pharmaceutical products.

Physicians varied in their attitude toward the detail men. One young and very kindly physician explained that he didn't feel that he obtained anything worth while from the salesmen's visits but these men made their living visiting doctors and he therefore felt that he should see them. It would appear that in the case of most physicians, feelings somewhat akin to this were decisive in influencing the doctor to give precious time to the drug salesmen. A very few doctors refused to see the salesmen or refused to see some individual salesman whom they disliked.

It was apparent from observation and statements from physicians that their practices in regard to medications and therapy are influenced significantly by the information and products supplied by the drug salesman. This would appear to indicate that the practitioner's habits are not immutable or so rutted that they cannot be directed.

VII: The Doctor's Workshop

Reference has been made to the fact that the physician, on entering private practice, is confronted with the necessity of making many decisions about his practice for which his training may not have prepared him. Specifically, he must decide what office space he needs as well as what to pay for such space. He must furnish this office and equip it with such professional equipment as he feels he will need. Obviously, it is desirable to have some help in his office. He must not only decide how many persons to employ and what their training shall be but he must also find those people, which is not a small problem in many areas. It is reasonable to deduce that the physician's own personality and his ideas concerning the scope of his work as a physician will be reflected in these choices. Probably most physicians at this time feel real anxiety about their financial prospects. Thus they may be led to set up practice in cramped, inadequate quarters and to skimp on furnishings, technical assistance and equipment, much to their later chagrin. The physician who is considerate of his patients may be expected to give reasonable thought to providing an office that is pleasing, quiet, restful and assures privacy to his patients. Organization and efficient routines achieved through provision of sufficient space and auxiliary helpers may contribute to convenience for both the patients and the doctor. The scope of the doctor's practice as he envisions it will determine in large measure the type and amount of technical equipment which he must supply.

These considerations prompted close scrutiny of the office space, laboratory and technical equipment and auxiliary workers encountered in these general practices.

A. Physical Plant

Variety of buildings

The actual buildings housing doctors' offices showed a remarkable variation. Some physicians followed the time-honored custom of occupying either rent-free or very low-rent space above or adjoining a drug store. Some had subsequently come to feel that this was a mistake and were making efforts to find other accommodations. Several offices were located in converted stores of one type or another and a few were in converted dwellings or other buildings. Many practices were housed in specially designed clinic buildings with accommodations for one or more physicians. Ten physicians maintained office space within hospitals. Generally speaking the clinic buildings or hospital offices provided the most attractive, most efficient and most complete facilities, although this was not invariably so.

Location in community

Note was also made of the location of the doctor's office in the community. Most offices were located within the business districts. In larger towns, particularly, this location forced patients to cope with the problem of automobile parking. Here, where the parking problem was most acute, very few physicians had been able to make special arrangements for patient parking. On the other hand, several physicians whose offices were located in residential areas had provided convenient and ample off-the-street parking space for their patients.

Appearance of offices

Considerable variation was also noted in the appearance of these practitioner's offices. The majority were pleasant, clean and attractive. Some, however, were only clean and neat and gave little evidence of thought for patient comfort. Almost a third of the offices visited might be properly considered as unacceptable for the use to which they were put. A few were actually dirty; others were in a very poor state of repair with stained walls, cracked paint and squeaky, uneven floors. Some were unattractively cluttered by the litter of years of occupancy. A very few were poorly heated.

Convenience of patients

Four-fifths of the practices visited were housed in offices at the street level or in buildings where adequate elevator service was available. The remaining offices were located a floor above the street level and thus presented patients with the hurdle of a flight of stairs. In some instances the buildings were old, the ceilings high, and the stairs both long and steep. Quite obviously this presents an unsatisfactory situation for many patients and many of the doctors were unhappy about it.

Utilization of office space

There were great differences in the number of rooms and the actual floor space available in physicians' offices. The smallest offices consisted of a waiting room and a combined consultation-treatment room with a small adjacent space for laboratory or pharmacy. At the other extreme, some practices were housed in well-planned clinic buildings providing waiting rooms, space for a secretary, multiple consultation-treatment rooms, as well as additional rooms for the laboratory and special treatment rooms. Some included minor operating rooms and delivery rooms. Others had lead-shielded rooms for X-ray equipment. Most offices fell somewhere between these extremes. About half of the physicians worked from a single examining room adjacent to a consulting room. In eight practices these two rooms were combined and the doctors, in effect, did their work in one room.

Some physicians utilized multiple examining rooms to great advantage. In these practices the nurse conducted patients to the examining rooms in rotation and had them undressed for the doctor. He could then see

patients without losing time while they were ushered in or out or while they were disrobing. In such situations it was apparent that the physician had given some thought to his own time as well as to that of the patients. In general the physicians who had provided themselves and their patients with these better facilities for practice rendered a higher quality of medical care. However, there were some striking exceptions to this generalization. For instance, one physician practiced in a specially designed modern clinic building with multiple examining rooms. He utilized his examining rooms to their fullest extent and he worked very expeditiously himself. This arrangement was highly efficient from the standpoint of time involved but the medical care provided was of a very low caliber.

Seven physicians maintained one or more beds either in the office or a small adjoining clinic for obstetrical deliveries. The elaborateness of these accommodations varied from a cot in a back room of the office to specifically planned private rooms in a clinic building. Some of these seven physicians clearly had adopted these measures solely for convenience while others had done so with the aim of providing improved service for the community as well.

Laboratory space

Physicians quite obviously attach different degrees of importance to laboratory aids in diagnosis and the amount of space allotted for laboratory use varied accordingly. Space ranged from none to a large room well equipped to do a variety of laboratory tests. Thirty-five physicians, including 10 whose offices were located in hospitals, had a special room set aside for laboratory work. Some of these rooms were small and poorly equipped while others were quite elaborate. Most of the remaining doctors had set aside a portion of another room to be used as a laboratory. In some instances the "laboratory" consisted of a small table and a sink in one corner of a room used principally for other purposes or the equipment was scattered about in several rooms.

B. Technical Equipment

Description and distribution

Table 30 shows the frequency distribution of several major pieces of laboratory equipment in the offices of these general practitioners. It should be pointed out that 10 physicians whose offices were located in hospitals are included in this tabulation, although in these instances the physician may not have been responsible for providing this equipment. However, it was available to the physician and at least in theory increased the scope of his work. In addition to the pieces of equipment enumerated in Table 30, a variety of other articles, both large and small, was noted. A few offices contained a bacteriological incubator, a water bath, an analytical balance or a machine for gas analysis.

TABLE 30

Distribution of Some Major Laboratory Equipment

Name of Item	No. Doctors	Percentage
(Total number of doctors)	(94)	(100.0)
Microscope	89	94.7
Refrigerator	87	92.6
Centrifuge	56	59.6
Electrocardiograph	40	42.6
BMR Apparatus	33	35.1
Colorimeter	25	26.1
X-ray machine with or without fluoroscope*	40	42.6
Fluoroscope only*	12	12.8

* Two physicians who had X-ray equipment available did not use it personally. In each case a partner in the practice was responsible for performing the X-ray studies. This explains why only 50 physicians have been credited with doing X-ray work.

Relation of critical equipment to qualitative rank

The availability of extensive laboratory equipment should increase the scope and effectiveness of a physician's services. Examination of this point quickly revealed that there was a relationship between the presence or availability of laboratory equipment and the quality of a physician's practice. Five major pieces of equipment seemed to be the principal indicators that varied with the level of the physician's performance; these were a microscope, a clinical centrifuge, an electrocardiograph, a BMR machine and a photoelectric colorimeter. Table 31 relates the increasing quality of medical care to the increasing number of these five pieces of equipment present in the practice.

TABLE 31

Distribution of Physicians by Qualitative Rank and Possession of 5 Items of Laboratory Equipment

Laboratory Equipment	Qualitative Rank V	IV	III	II	I	No.	Mean Qualitative Rank
None	—	—	—	3	1	4	1.8
Microscope only	—	—	3	10	4	17	1.9
Microscope + 1 item	3	6	8	6	7	30	2.7
Microscope + 2 items	1	—	10	1	1	13	2.9
Microscope + 3 items	1	4	2	—	2	9	3.2
Microscope + 4 items	2	5	4	3	1	15	3.3
Total	7	15	27	23	16	88	

In some practices the microscope was rarely used but five physicians, four of whom were graded, did not even possess one. It is also significant that all doctors whose practices were of a quality to place them in the two highest groups possessed one or more of the above items of equipment in addition to the microscope. The presence of radiographic equipment in the physician's office did not show the same discriminatory value as did the five items enumerated above. In other words, the doctors who owned or used X-ray equipment on the average provided no better care than those physicians who did not own or personally operate such equipment.

Economics of expensive equipment

There appears to be a common misconception that radiographic equipment, electrocardiographs and other instruments are "money makers" for the physician. This study was not intended to examine any problems of this type so only an opinion can be offered. The infrequent use of such diagnostic apparatus and the low fees often charged made it appear unlikely that many physicians ever recoup the expense of a basal metabolism apparatus, for example. The alternative explanation, that purchase of such equipment represents an attempt to broaden the scope of practice, seems to fit the facts better.

Amount of equipment and population of community

One might expect that physicians practicing in larger cities where elaborate laboratory facilities are generally available would have less need within their offices for extensive laboratory equipment. It might also be supposed that doctors in the smallest communities, many of which lack hospitals and laboratories, would make extensive provisions for these services. Such was not the case, however. It was found that physicians practicing in communities whose population was less than 1,000 had the least laboratory equipment and had devoted the least space to housing this equipment. Contrariwise, many of the physicians practicing in larger towns and cities had well equipped office laboratories, although they frequently utilized the local hospital as well.

X-ray equipment and its use

The type of equipment encountered ranged from a small 10 M.A. portable fluoroscope to much more powerful machines used for diagnostic work and deep therapy. Fifty physicians performed either part or all of their radiologic work. The training of the individuals who operated these machines and interpreted the films varied widely. One of these physicians devoted half of his practice time to radiology; this man had had extensive training in the field. Of the physicians who relied upon a trained X-ray technician for operation of the machine, all except one had offices located in a hospital. In most other cases the nurse or helper in the office or the physician who operated the machine had had only informal training, usually by the service representative of the manufacturer.

Most of the physicians who owned X-ray equipment feel that it is of vital help in meeting the problems of general practice. A few feel that

such apparatus is convenient but not indispensable. A few more stated that they would not do X-ray work in the absence of a partner interested or trained in the field. It is not the purpose of this report to argue the question as to whether or not a general practitioner should own and operate radiologic equipment. It should be quite apparent, however, that more than half of the general practitioners perform some radiologic procedures and most of these feel that it is indispensable in their practice. Clearly it would be much more desirable if these men could have some formal training in radiologic technique rather than having to depend upon service representatives for their information and training.

C. Auxiliary Workers

The more responsibilities and duties a physician can delegate to ancillary personnel, the more time he should have to devote to actual patient care. His aides can perform many tasks of professional and nonprofessional nature. Obviously the scope of the work undertaken by the physician determines in large measure the number of helpers needed. The physician's idea of his responsibilities to his practice and the number of ancillary services available in the community will also influence this need. The number of employees may indicate the thought given to organization and efficiency in the conduct of practice. Group practices are probably in a better position to hire trained assistants and to provide enough work to justify the salaries of these assistants.

Distribution of auxiliary workers

Three physicians in this study had no professional or ancillary help of any type. Others had such help on a part-time basis only. The vast majority of physicians had either one or two helpers. A few had more. It would appear that, on the average, physicians with two or more auxiliary workers provided better medical care than did those with fewer workers. However, this may not necessarily be a cause and effect relationship. The list of workers employed included secretaries, untrained personnel used as professional aides, registered nurses and laboratory technicians both registered and unregistered. The tasks performed by these workers ran the complete gamut from answering the telephone to caring for patients in the doctor's absence. As a rule the duties of these personnel were a combination of secretarial and medical.

Registered nurses

Many registered nurses were found in the doctors' offices but very few were utilized to the fullest extent of their training and qualifications. It was felt that most of the tasks performed by them could have been carried out by any intelligent person with a minimum of training. Many physicians, when queried, stated that they did not feel that a registered nurse was necessary and that they preferred intelligent, untrained personnel who could be trained to perform simple tasks about the office.

Medical technologists

Seventeen physicians had available the services of trained laboratory technologists. Some of these personnel were fully trained and registered while others had had less training but were still devoting all of their time to medical technology. Ten of these physicians with such technical service immediately available worked in offices located in hospitals. In these situations the technicians served not only the individual physician but also other physicians who utilized the hospital. Two physicians had hired trained technologists to work in their laboratories and these laboratories were planned to serve commercially several other physicians also. One doctor ran a small obstetrical clinic in conjunction with his office and employed a trained technologist who also helped out with many tasks other than laboratory procedures. A single physician in solo practice employed a trained technologist solely for laboratory work. Here again one finds that the practices in which such trained personnel were available were generally better than average.

DISCUSSION

Some differences in the quality of medical care have been compared with certain aspects of the doctor's workshop. Though imperfect indicators, the doctor's workshop and the people and equipment in it tell something of how well medicine is practiced. The presence in a practice of a technologist, a well equipped laboratory and efficient organization probably reflect the doctor's interest in and understanding of medicine and what he regards as important to its practice. The physician provides himself with the things he feels he needs for practice; personnel, equipment and an attractive office cannot make him a good physician. Concern with giving good medical care is, of course, concern for the patient's welfare. Thought given to the patient's comfort and convenience seemed to be correlated with the excellence of practice and this could sometimes be demonstrated objectively. In another chapter it will be noted that operation of an appointment system is positively correlated with good medical care. It has been stated previously that good medical practice is an overall skill; the relationship between good tools and good practice is part of the pattern.

VIII: The Doctor's Family and Community Background

A. The Physicians' Family Backgrounds

THE BACKGROUND OF A physician may be of importance to medical education in that its intellectual and economic resources may encourage or limit the student's length of training as well as general fitness for education and practice. Sociologists have long been aware of the tradition of education in certain families. The variations in economic resources of various occupational groups are well known. Davison has pointed out that there is a dearth of students from rural areas entering medical education in North Carolina, and the situation is probably not different elsewhere.[1] Fein in a separate and extensive study of North Carolina physicians has confirmed this finding.[2] The following examination was made in the hopes of finding factors that might be of importance in the selection of medical students and future physicians.

METHODS AND RESULTS

For the purpose of this investigation the occupation of the fathers of the doctors studied were grouped in seven classes. These classes are based, to a limited degree, on the U. S. Department of Labor's classification of occupations, but they differ in important aspects. The Department of Labor's education-based classification lumps all professions together, including such economically diverse groups as school teachers and doctors. Since it was felt that the economic backgrounds of the students might influence the length of their training, an attempt was made to obtain similar economic groupings and, insofar as possible, to group families with similar educational backgrounds. Several different groupings were attempted but the final one contained the following occupational classes:

A. Middle class professional persons. These included sons of physicians, lawyers, and engineers. (no. of doctors.....151)

B. Executive class. This class appears to be a higher economic group of somewhat heterogeneous composition, including a factory superintendent, district superintendent of a railroad, an industrialist, etc., (no. of doctors....6)

C. Other professional and semiprofessional groups. This class is educationally heterogeneous and economically homogeneous. It includes accountants, school teachers, ministers, and some sales persons who were judged to be economically similar. (no. of doctors.....111)

1. DAVISON, W. C.: *M.D., 6:* 85-88 (1951)
2. FEIN, R.: *Am. J. Pub. Health; 44:* 615-624 (1954)

D. Merchants and small entrepreneurs. This class is made up largely of small town merchants and includes such diverse groups as automobile dealers, furniture dealers, morticians, lumber dealers, employees of small insurance firms and postmasters. (no. of doctors.....15)

E. This is employmentwise the most homogeneous group and consists entirely of farmers. Some were poor and others were well-to-do. (no. of doctors .....33)

F. This group is made up of skilled workmen. (no. of doctors.....10)

G. This class is made up of unskilled workmen. (no. of doctors.....4)

Father's occupation and the physician's education and training

The effect of the father's occupation has been examined in relation to the doctor's educational background. Manlove, Anderson and Tipner[1] note the much higher mean 1952-53 tuition at the private medical schools than at state or municipal schools. It is interesting to note, of the doctors in this sample, 55.3 per cent graduated from private medical schools and 44.7 per cent graduated from state or municipal medical schools. In 1952-53 the number of students enrolled in private medical schools constituted 52.4 per cent of the total and those enrolled in state schools was 47.6 per cent of the total. The distribution obtained in this study would seem to be sufficiently close to the present enrollment to conclude that these physicians are not atypical.

Within the occupational groupings used here there did not appear to be any distinctive trend associated with the economic background of the doctor insofar as attendance at either private or state schools is concerned. In the B group, the sons of executives and major business men, an undue proportion appear to have gone to state schools but the numbers are so small that one can draw no conclusion. Contrariwise, all the sons of unskilled laboring men went to private schools. This would appear to be a highly suspect result if it were assumed that students from poor economic backgrounds invariably went to the less expensive state medical schools. It appears that private and public medical schools select students from all types of family backgrounds. A further examination failed to show any association between the presumptive economic status of the physician's family and the geographic location of his medical school.

A comparison of the length of the premedical course in relation to the occupational classification of the doctor's family was also made. The differences were found to be very small and of no significance. Since the amount of premedical training is regulated by the medical school to a greater degree than by the student, this is not surprising.

The intern and residency programs are the only portions of a doctor's training over which he has a large measure of control. It is generally assumed that finances often limit the length of this period. It was of interest, therefore, to examine the amount of time spent in intern and residency training by the doctors coming from these diverse backgrounds. The results are presented in Table 32. Of the 21 doctors whose fathers were in the A or B groups (professional classes) 66 per cent spent more than one year of training after medical school and the average length of training for

1. Manlove, F. R., Anderson, D. G., Tipner, A.: *JAMA, 153:* 105-147 (1953)

TABLE 32

Relationship Between Father's Occupation and Length of Training

Group	Total Number	With more than one yr. training		Average length of training
		No.	Percent	Months
A	15	10	66	20.0
B	6	4		20.3
C	11	7	64	17.7
D	15	7	47	17.0
E	33	9	27	14.5
F	10	5	50	17.7
G	4	2		17.0
	—	—	—	
Totals	94	44	46	

both groups was 20 months. At the other extreme the 33 sons of farmers showed a very different picture. Only 27 per cent of this group spent more than one year in training and the average length of the training for the entire group was 14.5 months. Groups C, D, F and G appear to be similar in that the average length of training was approximately 17 months. Though the results of this tabulation seem to show quite marked differences they did not prove to be statistically significant.

The family occupational classification and the doctor's place of practice

Considerable attention has been given to the origin of medical students since several recent studies indicate that medical students tend to return to practice in areas similar to those from which they came.[1, 2, 3] The doctor's place of practice was examined to see if the father's occupation influenced him to return to his place of origin or to another to practice. The father's occupation apparently makes very little difference to the doctor in his selection of a place to practice, with the exception of doctors' sons. Almost all the sons of physicians were practicing with their fathers or in practices formerly carried by their fathers.

The family occupational classification and quality of a physician's work

The admissions committee of a medical school which did not give weight, consciously or subconsciously, to the family of an applicant would probably be unusual. The father's occupation was compared with the quality of the doctor's work as described in Chapter III. The sons of executives (B group) were better (mean qualitative rank 3.7) than the average ($P =$ less than 5 per cent). The only other deviant was group D (small

1. Diehl, H. S.: *JAMA, 145:* 1134 (1951)
2. Davison, W. C.: *JAMA, 115:* 2227-2232 (1940)
3. Hyman, O. W., *J. Assn. Am. Med. Coll., 12:* 301-304 (1937)

merchants and entrepreneurs) whose mean qualitative rank was 2.2. They, however, were not significantly different from the average. Being the son of a physician does not appear to be a fact of any importance in predicting the quality of a general practitioner's performance, although some medical schools apparently attach some weight to it in selecting students. It appears from the results obtained from this comparison that the father's occupation is of little importance in selection of men as potential general practitioners.

B. The Doctor's Place of Origin

The increasing concentration of physicians in cities appears to be a cause for concern insofar as there is a correspondingly slower rate of recruitment of physicians for rural areas. It appears that this trend may be aggravated by the greater tendency to recruit physicians from urban populations. Most studies of the problem of physician distribution have been based on all doctors, among whom are the specialists whose practices are almost of necessity limited to cities. While this study is not well adapted for this type of problem, its limitation to general practitioners and the detailed information obtained provided data of some interest.

Origins of North Carolina general practitioners

The 94 doctors in the sample were drawn from 15 states. Sixty-eight came from North Carolina. Sixteen were from the Southeast, four from New England or the North Atlantic states, three from the Midwest and three from the Far West. Among the sixteen doctors from the Southeast, most came from states directly adjoining North Carolina. In a few instances such a move was a mere matter of crossing the border and sometimes represented less change in community or location than many intrastate movements.

Relationship of a physician's origin to place of practice

The urban-rural distribution of physicians has shown increasing and disturbing disparity in recent years. In Table 33 the population of the doctor's place of origin or major residence* prior to going to a university is compared with his present place of practice. The population of the major residence has been adjusted to the period when the doctor lived there. There was considerable migration of doctors in all directions. Among these doctors, 21 were practicing in a town the same size as that of their origin, 24 were practicing in smaller towns, while 49 were practicing in larger towns. It can be seen from the table that of 53 doctors whose place of origin was rural, there were 22 doctors (41.5 per cent) practicing in rural areas. Among the 41 doctors whose origin or major residence was in towns of greater than 2,500 population, 12 or 29.3 per cent are now practicing in rural areas. Although this would seem to support the thesis that more

* The place of major residence is defined as the doctor's place of longest residence between the ages of 5 and 18 years. In most cases it is no different from the place of origin (birth), but there were enough doctors who had multiple previous residences to make this necessary.

TABLE 33

The Effect of Origin on the Doctor's Place of Practice

Population Place of Origin	Population, Place of Practice: Under 1,000	1,000-2,499	2,500-9,999	10,000-49,999	50,000 and over	Totals
Under 1,000	9	9	12	7	5	42
1,000 - 2,499	1	3	5	1	1	11
2,500 - 9,999	0	4	3	8	0	15
10,000-49,999	1	3	5	4	1	14
50,000 and over	1	3	5	1	2	12
Totals	12	22	30	21	9	94

doctors of rural origin return to rural areas to practice, the difference is not statistically significant.

Among the 53 doctors of rural origin, there were 33 whose major residence was on farms. Since medicine is almost invariably practiced in towns, the presence of this large group who came from farms must necessarily influence considerably the migration pattern of doctors.

That doctors do, in a considerable number of instances, tend to return to the areas from which they came to practice is demonstrated by another type of compilation made on the same data. Of the 94 doctors in this sample, 29 (30.8 per cent) returned to their original towns, or in the case of previous farm residence, to the counties of their origin to practice medicine. Another 29 (30.8 per cent) practiced 50 miles or less from their previous residences. Thirty-six (38.3 per cent) were practicing more than 50 miles from their previous residences. Among the latter group, there were representatives from widely scattered parts of the whole United States. It appears that among general practitioners approximately 60 per cent return to the area in which they grew up for purposes of practice. However, this may be different from returning to a rural area.

From the above it appears that several things are true. Davison's[1] observations that students tend to return to their home town in a large percentage of cases to practice appears to be borne out among general practitioners only to the extent that a third do return. Another third do not migrate very far, but the shift often involves a rural to urban transfer. However, it would appear that among the doctors who do not locate in their home town or county migration proceeds both from smaller to larger areas as well as from larger to smaller cities.

This considerable migration is not a recent development. When these figures were broken down on an age basis it became evident that doctors in the sixth and seventh decade of life had migrated with the same frequency as doctors in the third and fourth decade. The average age of physicians in smaller towns was not different from that of those in larger

1. Davison, W. C.: *M.D.*, *6*: 85-88 (1951)

communities. While there appear to be different rates of recruitment of general practitioners to rural and urban centers, this data does not suggest that the ratio is changing rapidly. Lastly, it might be mentioned that doctors who migrated to North Carolina from other states did not show a different distribution in terms of the population of the city of practice from doctors whose origin was North Carolina. An interesting and somewhat surprising discovery in the course of this study was to find doctors from the country's large metropolitan centers practicing in some of the most isolated situations in the state.

The physician's origin and the quality of his work

In the section on medical education it has been noted that the doctors' places of origin appeared to exert no influence on their performance in medical school. On the other hand, doctors whose origins were in towns of greater than 50,000 population appeared to be better physicians than those from smaller communities (P = less than 2 per cent). Among doctors originating in towns of less than 50,000 population, size appeared to have no effect.

Selection of a practice location

The process of selection of a place to practice is complicated. It was investigated by asking the physician how he went about the process and also trying to determine if there were any evidence of selection, other than personal preference, that had operated among physicians in relation to their practice locations. The latter problem was approached by first comparing the general practitioners in the different population groupings previously considered with respect to their medical education and training. There were no significant differences between doctors in different sized towns on the basis of academic performance, in total amount of training served or in training in internal medicine. These have been shown to be related to other aspects of practice but they apparently do not influence selection of a practice location. Examination of the quality of a physician's work in comparison with the population of site of his practice revealed that those physicians practicing in communities of 1,000 to 2,499 and those in cities of over 50,000 population had the highest Mean Qualitative Rank while physicians in communities of less than 1,000 had the lowest.

Among physicians practicing in towns of 1,000-2,499 population, 10 out of 21 were in group practice, whereas all physicians practicing in towns of less than 1,000 population were practicing alone.

> The reasons given by the physicians for selecting their practice locations were diverse. Among the group of doctors who went back to their home towns or were practicing within the county of origin, the fact that this was home, that this was where their roots were, that this was where they had financial interests, or other similar motives were often given for returning. Most sons of physicians tended to return to practice in the same community and often in the same office as their fathers. Among the doctors who did not locate in their home town or home county, the reasons for selection of locations were highly individualized. Many considerations appeared important. Among these were size of community, proximity to the physician's or wife's family, friends, offer of a partnership, deferment from military service in an under-doctored area, an offer of free office space, loyalties to institutions, recreational facilities as well as others.

Movement of general practitioners

A considerable number of the doctors made several moves before they ultimately settled down. Several doctors followed a rather common pathway into practice by associating with an older doctor. It would appear that while this may occasionally be successful, it is very frequently disastrous. Some left after a very short period of time, usually stating that they had to do all the work and the older doctor took all the money. Established physicians often complained that younger partners wanted larger salaries but did not want to do the work necessary to earn them.

Among the doctors who graduated from medical school in the 1930's quite a few moved about from one post to another seeking a town where they could make a living. Four doctors left private practice for the armed services or institutions of practice during the early 1930's because they "could not collect enough to pay the office rent." Two or three of the depression years' graduates ultimately found towns less affected by the depression in which they were able to make a living. In contrast to these stories of beginning practice in the early 1930's are the more recent histories of physicians who had left practices in certain areas because they were too busy.

The histories of finding suitable locations would indicate that most doctors find practice locations quite readily. The sample of doctors studied was broken down by location in which they practiced up to the time they were seen in this study. In doing this all of the doctor's private practice locations, following completion of his training, were counted even though these may have been for periods no longer than a month. Service in the armed forces has not been counted except for one doctor who had made a career of the army. This tabulation somewhat underestimated the extent of movement among doctors from one location to another since theoretically such movement is not finished until the doctor dies or retires from practice. Fifty-eight doctors remained in the first city or town selected for practice. Thirty moved once or twice before finding a permanent location with a diminishing number trying out more locations.

Among four doctors who practiced in five or six different locations, two appeared to be inveterate movers in that they had not stopped moving at any time in their professional careers, whereas two appeared to have stabilized ultimately after many changes.

Satisfactions and dissatisfactions with place of practice

Each doctor was asked what fact in his local community caused him to stay. Quite a few of the doctors who had returned to their place of origin stated that it had never occurred to them to consider any other or that the factors which had caused them to return to this area had caused them to stay here ("This is home. This is where I have my roots." etc.) The other commonly given reasons for having decided to settle permanently in a given situation were friends, liking for the area, success in building up a practice or lack of reason for leaving. Quite a few of the doctors stated that when they originally took up general practice they had expected to remain only long enough to earn money to return for further training. Early success, good income, formation of friends, liking for the community, or other similar considerations persuaded the doctor to remain.

Each doctor was asked whether the location of his practice was a good one for conducting a general practice. It was hoped that asking this question might

reveal something about the forces which attracted general practitioners to certain areas or made them avoid others. Most doctors stated that their own area was a good one for general practice. There were only 17 who were critical. The criticisms most commonly heard were directed toward specialists. In the larger cities the difficulties in obtaining hospital appointments or the limitations placed on general practitioners in hospitals proved irksome to some. An extreme example was an older physician who referred to himself as a "disqualified doctor" because he had recently been subjected to normal hospital supervision with respect to his obstetrical practice.

A few doctors were concerned about competition with specialists. Only two doctors complained about the lack of local medical facilities. There were 33 doctors who regarded their areas as excellent places for general practice, mainly because competition with specialists had been resolved in favor of general practice. Some doctors noted that the population of the area was too sparse or the town was too small for specialist practice, or that the general practitioners were in control and presumably therefore the town was a satisfactory one for general practice. Competition with other general practitioners was mentioned infrequently.

There were a number of doctors who seemed to have diverse reasons for regarding their own areas as pleasant or unpleasant. A few mentioned the excellence of local medical facilities and there was another group, mostly men located in small towns, who commendably equated a good place to practice with an area that needed a general practitioner.

There was another interesting group of eight doctors who perhaps had more reasons to like their areas for general practice than others. These eight doctors all had in one way or another created their own environment for practice. The doctors in this group were men with well directed "drive" who had provided leadership or had created facilities for medical care in their own area. This usually took the form of building clinics with good laboratories and facilities, but in other instances the doctor appeared to be responsible for the success of a community hospital.

DISCUSSION

The foregoing examination of the family and community background of 94 general practitioners in this sample produced rather little useful information. Although it is perfectly obvious that the family background of an individual must shape his subsequent performance to a considerable extent, readily ascertainable facts that could be classified seemed to bear little relationship to anything significant in the doctor's education or practice. The economic background of the family seemed to have little effect on the choice of medical school attended or the amount of training taken. Although the physicians who were sons of executives exhibited a mean qualitative rank significantly above the average, the father's occupation generally would appear to be of little help in selecting men for the practice of medicine.

The study of physicians' choices of places to practice shows that about two-thirds of physicians tend to practice very close to the area from which they came. Somewhat more rural physicians came originally from rural areas although the difference between this group and those with an urban background was not large. General practitioners who grew up in cities of greater than 50,000 population were on an average better doctors than the rest of the sample. Larger cities provide a variety of environmental and educational conditions that might be considered as an explanation for this difference.

Attempts to determine what factors influenced a doctor's choice of a practice location were not altogether satisfactory. Reasons for selection of a particular community for practice were extremely variable and the factors which influenced the physicians to select one area seemed to be

largely personal. The presence or absence of medical facilities rarely seemed to be decisive. This may be because hospitals are so well distributed that there is little need to weigh this factor.

IX: Non-Medical Activities

Recreation

DISCUSSION OF THE doctor's use of his leisure time may seem somewhat tangential to the purpose of this study. The doctor's use of his leisure was considered to be of potential importance insofar as it might pay dividends in greater effectiveness in practice. It was further felt that the doctor's use of his recreational time or the character of his hobbies might contribute some understanding of the doctor as a person which would have a bearing on his work. The Strong Vocational Interest Blank and Medical Specialists Preference Blank are built on individual interests, likes and dislikes. These tests apparently identify personality traits which distinguish between surgeons, pathologists, internists and psychiatrists.[1]

While no such ambitious expectations were attributed to examination of the doctor's recreation, it was hoped that the results might be worth the small effort necessary to obtain this information.

In the section dealing with the doctor's workday, reference will be made to the long average workday of the general practitioner as well as the extremely long hours of work put in by the busiest physicians. Among a few of these physicians the week's activities can be described in terms of eating, sleeping, working and going to church on Sunday. There was manifestly little time for recreation. Among the 93 doctors for whom information was available, 13 described themselves as having no hobbies or special recreational activities. In a few instances demands of practice were such that on his day off the doctor did anything that allowed him to escape from the incessant demands of his practice and the constant ringing of the telephone. Among these doctors without definite recreational patterns, quite a few loafed about their houses, spent the day with their families, or if the demands of their practice were too insistent, visited with relatives in other towns where they could not so readily be found.

A wide diversity of hobbies was found. About half of the doctors did some hunting, a quarter fished and a dozen played golf. Cottages on lakes or the ocean and the attendant water sports were also frequently encountered. Photography, "hi-fi," "ham" radio, woodworking, raising horses, dogs or other animals, reading, gardening, house repairs, farms, real estate management or business enterprises were hobbies occasionally encountered. A few doctors found their recreation in watching television, going to the movies or following sports events. These were more common among doctors who, for some reason or another, found it difficult to pursue more active

1. STRONG, E. K. JR., TUCKER, A. C.: *Psychological Monographs, 66;* No. 9 (1952), published by American Psychological Assn., 1515 Massachusetts Avenue, N.W., Washington 5, D. C.

recreation. Among the less common recreational activities were card playing, civic work, travel, scrap books, trading cars, drawing, pool playing, piloting planes, gun collecting, investing, paper hanging, building model trains and writing.

Among these very diverse hobbies no definite pattern could be detected that could be related in any way to the doctor's work. Presumably creative hobbies were no more frequently associated with one form of practice than another. The doctors doing better work tended to have more hobbies than those doing a poorer quality of work, though the differences were too small to be important. A few doctors who expended almost all of their energies on some avocations did not appear to be greatly interested in medicine. Though recreational activity is undoubtedly very important, it did not appear from this brief examination to have any consistent relation to a doctor's performance.

Civic and voluntary organizations

During the course of this study, information was obtained as to the extent that doctors assumed responsibilities for civic or governmental functions. As with other medical activities, it was felt that this might aid in understanding the doctor.

Among the 93 doctors for whom information was available, 16 were holding civic office at the time of the study. There were in addition one or two doctors who had previously served on town or county boards of one type or another. Among these 16 doctors there were six who were serving on town or county boards of health (and a few who had been on boards of health), eight serving on school boards, two on town councils, and in three instances other functions were undertaken. One doctor was a candidate for an important office. Another was a member of the zoning board and a third was on a minor town board. A few of these doctors occupied more than one civic post.

The doctors interested in civic affairs appear to be drawn from all types of practice—very good and very poor, as well as intermediate grades.

Most of the doctors seen during the course of this work were far too busy to have spare time to devote to civic office. The difficult, tedious conduct of business which must be undertaken by school boards, town councils, boards of health and other civic committees clearly would not form a very desirable or happy change from the demands of general practice. A rather small number appeared to be interested in the public health problems.

Voluntary organizations are in a somewhat different category than civic offices. Membership in the Rotary or Lions Club may provide fellowship, relaxation and other intangible benefits. A small number of doctors mentioned church as an important interest. Among the 94 doctors there were a few who were real "joiners," a large number who were active in one or two organizations and a small group who took no active part in any type of voluntary activity. The doctor's participation in the work of the voluntary organizations seemed to bear no relation to any of the observable facts about his practice such as age, work load or quality of practice.

X: The Doctor's Hours and Wages

A. Hours of Work

DURING THE COURSE of this study the authors, in common with previous observers, were impressed with the selflessness of many general practitioners in regard to their time and efforts. The irregularity and frequency of the demands made upon the physician's time are greater than in most professions. He is pictured in the minds of many as being ever available, never too fatigued to see one more patient, and having little personal need for rest or recreation. Many of the general practitioners participating in this study fit this picture.

METHODS

By means of personal observations, the length of a typical workday was determined for each physician. In order to do this the observer accompanied the physician on his hospital rounds, his house calls and his office hours throughout the day and evening and sometimes into the night. Because of inconvenience to both, the observer did not usually go with the physician on unexpected calls received after finishing his scheduled rounds in the evening. Therefore, the observations reported here do not include the hours which the physician might have spent making calls late at night, or very early in the morning. These exclusions introduce an error of unknown magnitude into the tabulation of each physician's workday, but the direction of the error is known. Naturally, the workload of any physician varies from day to day and from season to season, but it is believed that these figures provide a real indication of each physician's usual workday. Each physician was asked if he worked on an appointment system, either in whole or in part.

RESULTS

Average workday

Of the 94 practices visited, observations in 90 yielded figures useable for the purpose of comparison. Great variation was noted between individual practices in the length of an ordinary workday. The shortest workday was three hours in length and the longest was 16. The average for all 90 physicians was 9.3 hours per day. Extrapolating this figure on the basis of a 5½ day workweek, one derives a total of 51.2 hours per week. This figure in itself is not very impressive although it exceeds the accepted normal work week of 40 hours by 25 per cent. However, it should be reemphasized that this figure fails to reflect the true picture of the hours

of work of these general practitioners because it excludes night calls, night obstetrical deliveries and work on Sundays. Although these doctors work long, hard hours, they contrast somewhat with the picture drawn by earlier writers of fact and fiction. The pattern of practice apparently has changed substantially in the last half-century. The work week of the laborer and merchant is now shorter, and the general practitioner also has been able to reduce his hours of work. Improved methods of transportation and communication, more hospitals, new drugs and methods of treatment, and public education have all contributed to this changing pattern of practice.

Physician's age and workday

As one might expect, older physicians tend to work shorter hours than do the younger ones. Table 34 shows that general practitioners below the age of 30 work an average of 12.4 hours per day, whereas physicians in the 61 to 65 age group average 7.8 hours per day. Thus the younger physicians have a 59% longer workday than do the physicians in the oldest age group studied. Undoubtedly physical stamina and energy are partial determinants of a physician's workday. The zest for putting into practice some of his painfully acquired academic knowledge and also the desire to build a large practice and acquire financial security play additional roles in defining the longer hours of the younger physician. The shorter working hours and smaller practices of the older physicians result partly from voluntary restrictions and partly from involuntary forces. Ill health is one factor, and public preference for a younger, more active physician is probably another. Some of the older physicians had acquired new interests outside of the practice of medicine and preferred to take time away from practice to allow for more concentration on these outside interests. Such a division of interests was not found to any significant degree amongst the younger physicians.

TABLE 34

Distribution of Physicians by Age and Daily Hours of Work

Hours of Work	Age in Years					
	25-30	31-40	41-50	51-60	61-65	Totals
5 or less			4	2	1	7
6 - 8	1	10	6	8	1	26
9 - 11	2	14	13	7	3	39
12 - 14	1	10	3	1		15
15 or more	3					3
Totals	7	34	26	18	5	90
Average hrs. worked	12.4	10.0	8.5	8.0	7.8	

TABLE 35

Relation of Hours of Work and Net Income from Practice

Hours of Work	No. of Doctors	Mean Net Income
5 or less	6	$ 9,600
6 - 8	23	13,800
9 - 11	35	16,400
12 - 14	15	18,200
15 or more	2	27,500
Total	81	

Size of community and workday

The physicians whose practices were located in the smaller communities worked longer hours than did the physicians in the larger urban communities. Physicians practicing in towns having a population of less than 2,500 averaged a 31 per cent longer day than did the physicians in cities of 50,000 or more. This is probably attributable in part to the well known fact that the physician-population ratio tends to be higher in the more populous areas.

Hours of work and income

Table 35 shows the relation between hours of work and income. There is a linear relationship between them that is statistically significant with a probability of less than one per cent.

Hours of work and qualitative rank

There was no discernible relationship between the amount of time devoted to practice each day and the quality of care rendered. Thus, the popular idea that a busy doctor is a very good doctor does not appear to be entirely justified. The fact that the best doctors spend no more time in their practices tends to refute the idea expressed by some that "I could do a better job if I had more time." Patients' selection of a physician is necessarily based on inexpert criteria; their satisfaction does not appear to relate always to his clinical skill.

Round-the-clock availability

Although all of these physicians either made themselves available for emergencies on Sundays and holidays or arranged to have their practices covered by a colleague, 10 maintained formal office hours on Sundays. As a rule this time amounted only to one or two hours and was set aside principally for patients who had been seen previously and who required specific continuing observation or medication. A similar situation obtained in regard to availability during the evening. While only six of these physicians maintained formal office hours during the evening, the remainder

usually made arrangements for close telephone contact so that they were, in effect, available throughout the day and night. Sixty-three physicians maintained formal office hours on Saturday afternoons, many of them remarking that "Saturday is my biggest day." In many practices the Saturday afternoon hours represented a concession to the local mores. In the rural parts of this state it is still customary for many farm families to come into the town or village on Saturday afternoon for transacting business, social gatherings or calling upon the physician.

Most physicians attempted to close their offices for a half day during the week, while a few did so for a whole day. Although these physicians usually referred to this as "my afternoon off," it was noted that this time frequently was not spent in the recreation for which it was intended. More often the afternoon was spent, either in whole or in part, catching up on house calls, seeing very sick patients or completing hospital records. Some physicians in the smaller communities had learned that in order to have any time at all to themselves or with their families they had to get away from town or in some other way actually seclude themselves from a few inconsiderate patients. This was never done, of course, unless another doctor was available in the community. One physician who habitually left town on his free afternoon to visit a nearby lake for boating said that he could hardly enjoy this free time because he knew there would be patients waiting at his home and office when he returned in the evening.

Appointment system

It was found that 34 physicians maintained an appointment system, either wholly or in part, in conducting their practices. In response to queries about this, some physicians felt that they could not run a practice without a strict system of appointments although all made provisions for seeing the casual drop-in patient. On the other hand, the majority of physicians stated with varying degrees of feeling that the nature of their practices would not allow them to operate an appointment system. In many instances, particularly in rural areas where telephone communications were limited, it was apparent that attempts at a rigid appointment system would operate under severe handicaps. Appointment systems were found in practices of every type and in every area, including the most sparsely settled. In some situations it was believed that the failure to utilize this device for systema-

TABLE 36

Relationship Between Use of Appointment System and Mean Qualitative Rank

Appointment System	No. of Doctors	Mean Qualitative Rank
Entirely	17	3.35
Partial	16	3.06
None	55	2.40
Total	88	2.70

tization of practice was due at least in part to the physician's own reluctance to discipline himself to this degree.

Previous allusion has been made to the fact that the doctor's equipment and routines reflect his concern for the quality of care which he renders and for his patients' comfort and convenience. One aspect of this is depicted in Table 36. In the table "entirely" means the physician scheduled all or nearly all of his patient visits while "partial" indicates that some of his visits were scheduled.

Thus it is seen that physicians who attempted to utilize economically their time and that of their patients by means of an appointment system were on the average better doctors. The difference between doctors with a partial or complete appointment system and those with none is statistically significant (P = less than 1%).

DISCUSSION

These results indicate that general practitioners do indeed work long hours. The figures would be much more impressive if they included time spent making calls during the late night and early morning hours and on Sunday. The fact that some physicians in semi-retirement who work only a few hours a day have been included in calculating the average causes the figure to be lower than is actually the case for fully active general practitioners. The figure of 51.2 hours per week is lower than the figure of 60 hours per week for general practitioners found by Rusk et al[1] in their study. However, the two are not strictly comparable because of exclusions previously mentioned. The figures cited by Rusk were determined from information obtained by questionnaire and probably included hours spent working during the night and on Sundays. On the other hand, these findings do agree with Rusk's that older physicians tend to work fewer hours than do younger ones and that the physicians in the more densely populated communities also tend to work fewer hours than the physicians in the smaller communities.

One can only speculate that the emotional tension developed by repeated days of exacting work, plus the inability to relax in the evening in the knowledge that one's rest is liable to be interrupted, may exact a heavy toll on the physical and mental health of these physicians. One finds evidence that such is the case in the work of Dublin and Spiegelman[2] who showed that the death rate for diseases of the heart and coronary arteries is 845.3 for male physicians as compared with 713.7 for all white males. A study of death certificates of North Carolina physicians from January 1950 to April 1954 appeared to show a higher rate of deaths from cardiovascular diseases among general practitioners than among specialists or the white male population. Suicides were also more frequent among general practitioners. The data of Morris, Heady and Barley[3] support these fiugres and show that the British general practitioner is more liable to die of

1. Rusk, H. A. et al: *New England J. of Med., 249:* 678-681 (Oct. 22), (1953)
2. Dublin, L. I., Spiegelman, M.: *JAMA, 134:* 1211-1215, August 9, (1947)
3. Morris, J. N., Heady, J. A., and Barley, R. G.: *Brit. Med. J.* 503-520, March 8, (1952)

coronary artery disease than his specialist colleagues or males in other professions. In the United States, Abrams who has recently reviewed "The Doctor's Health" states, "Most striking of all is the consistently inferior health picture of general practitioners as a group when compared with specialists."[1] The death rate of all physicians is no greater than that of the general population of white males.[2, 3] The excess death rates at certain ages and from certain causes such as coronary artery disease can be only inferentially related to so vague a concept as "strain" or "excessive work."

B. Physicians' Incomes

Each physician was asked for the amount of gross and net income which he derived from private practice during the preceding year. Since these data were intimate and privileged the figures were accepted without question. Usually the physician was able to relate these figures from memory without recourse to records and the figures were most often rounded to the nearest thousand by the physician. On some occasions physicians felt it necessary to refer to records, either the income tax form for the previous year or general business records. Each physician was asked to exclude from these figures income derived from sources other than the practice of medicine. Although the question was not worded specifically to determine the net income before payment of taxes, it has been assumed in each case that the figure for net income does represent income calculated before payment of taxes but after deduction of operating expenses. In at least two instances where physicians owned and operated small hospitals which furnished care for bed patients it was impossible for the physician to determine exactly how much of his income resulted from his personal services and how much resulted from operation of the hospital facilities. In two instances the physician had not been in practice for a full year; in these cases the figures available for the fractional year were accepted and adjusted to cover a 12-month period for the purposes of comparison.

In some instances where the figures reported for net income seemed disproportionately low in relation to the gross income, material surroundings or patient load, several factors may have been at play. For instance, the physician's collections may have been unusually poor in that year or he may have claimed a large depreciation for a building or equipment. This latter factor is known to have influenced the figures reported by two physicians, and it may have been at play in other instances, also.

The figures presented here apply for the most part to income received during the calendar year, 1952. However, in a few cases the figures represent income for the calendar year, 1953.This difference in reporting introduces an error of unknown magnitude but it is considered to be slight.

Obviously, many factors determine the level of a physician's income; some are under his control while others are not. Statistical analyses were

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1. Abrams, H. K.: *GP, 9:* 36-47 (1954)
2. Dickinson, F. G., Everett, L. W.: *JAMA, 139:* 1129-1131 (1949)
3. Dublin, L. I., Spiegelman, M.: *JAMA, 134:* 1211-1215, August 9, (1947)

TABLE 37

Comparison of Net Income of U. S. Physicians with that of North Carolina General Practitioners

	U. S. Physicians (Department of Commerce 1951)	N. C. General Practitioners
Number	413	83
Mean	$13,378	$15,720
Median	$11,382	$15,000

performed in an effort to identify some of these factors and relate them to the practices which were studied.

RESULTS

Comparison with U. S. Department of Commerce figures

Table 37 compares these figures with those obtained by the Department of Commerce in 1951 and published in its Survey of Current Business in July 1952. It is readily apparent that the income reported by general practitioners in North Carolina is considerably higher on an average than that reported by the Department of Commerce. There seem to be three major possibilities to explain the discrepancy between these figures. (1) This study was limited to general practitioners whereas the Department of Commerce data includes specialists in addition. (2) The Department of Commerce questionnaire returned to a government department may have stimulated doctors to under-report income. Likewise, the present figures may represent an optimistic estimate of income. (3) Physicians' incomes may have increased substantially between 1950 and 1952-53. In addition, income was found to be higher among physicians in group practices. More physicians in group practice were encountered in this study than were reported in the Department of Commerce Survey.

Interrelation between physician's age, scope of practice and community size

In analyzing the various factors which influenced income it became apparent that the physician's age, the scope of his practice and the population of the community in which he practiced all affected his net income. It will be noted in Table 38 that income drops off rather sharply past the age of 50. It can also be seen that physicians with the widest scope of practice including medicine, obstetrics and major surgery earned the highest income. In addition, it shows that physicians in the very smallest and the very largest communities had lower incomes than physicians practicing in communities of intermediate size. These differences are of statistical significance. These three factors are interrelated and appear to influence one another. For instance, physicians limiting their practice to general medicine and pediatrics, (Type I) are, on the average, older than physicians carrying on practices of wider scope. Also, it was noted that no physician doing major surgery was located in the smallest or the largest communities.

TABLE 38

Influence of Physician's Age, Type of Practice and Population of Community on Net Income

Age in years	25-30	31-40	41-50	51-60	61-65
No. of doctors	6	34	23	15	5
Mean net income	$21,400	$16,600	$16,200	$12,900	$9,200

Scope of practice*	I	II	III
No. of doctors	14	55	10
Mean net income	$9,740	$15,970	$22,940

Population of community	under 1,000	1,000-2,499	2,500-9,999	10,000-50,000	50,000 and over
No. of doctors	9	21	27	17	9
Mean net income	$11,900	$18,900	$16,300	$16,400	$9,100

Practice arrangements	Group or Partnership	Single
No. of doctors	22	61
Mean net income	$20,543	$13,980

*Type I practice includes only general medicine and pediatrics. Type II adds obstetrics while Type III adds obstetrics and major surgery.

It was believed that the physician's age, the scope of his practice and the population of the community in which he practiced might be the major determinants of his net income. Therefore, statistical analysis was performed in order to learn which of these three factors might be the most important. The results of this analysis indicate that the age of the physician is the dominant factor and that the type of practice and the population of the community have less influence on income. However, important as these relationships appear to be, they actually explain slightly less than 10 per cent of the variation in net income of the physicians co-operating in this study. Obviously, other as yet unidentified factors are of much greater importance in determining the level of physicians' incomes.

Income and qualitative rank

In an effort to reveal other relationships, additional comparisons were carried out. Table 39 shows that there is no linear correlation between the quality of medical care provided by a physician and his net income. Actually this is hardly surprising in view of the fact that the lay public has few valid criteria for assessing a physician's competence. Indeed, it is part of folklore that a layman values a physician's personality or "bedside manner" more highly than his professional knowledge which may be less tangible or evident. The physician with the higher income is able to purchase more medical journals, attend more professional meetings and acquire more equipment to be used in practice. However, the mere ability to do these things correlates imperfectly with the quality of medical care rendered.

TABLE 39

Relationship Between Quality of Practice and Net Income

Qualitative Rank	Mean Net Income
V	$14,500
IV	18,900
III	17,300
II	14,600
I	13,400

Other relationships

Physicians who were the sons of professional men or executives tended to have a higher net income than did the sons of laborers, farmers, small business men and others. The implications of this finding are not clear.

Earlier (Table 38) it was noted that physicians practicing as members of a partnership, association or group earned significantly higher incomes than did their colleagues in solo practice. Figures from the Department of Commerce on the nationwide study confirm this finding. This may be the result of more efficient organization of practice or other unrecognized factors.

The length of the physician's workday is directly related to his income. It was noted in a previous chapter that the number of personnel employed

by physicians ranged from none up to a total of five, with most doctors employing one or two helpers. There is a direct linear relationship of statistical significance between a physician's net income and the number of his employees. Thus, higher income is associated with more personnel in the doctor's office. This finding is interesting and not wholly unexpected, although the tabulation gives no clue as to the direction of causality if any exists. It seems probable that a higher income simply enables the physician to employ more help; it is unlikely that more employees contribute significantly to the physician's income.

There appeared to be no significant relationship between academic performance in medical school and subsequent income from private general practice.

Physicians who performed some or all of their own radiologic work tended to earn higher incomes. However, since many in this group were younger and also performed major surgery, these factors may be more important than use of radiographic equipment. Actually, very few physicians utilized this equipment to its fullest extent, and observations led to the distinct impression that such limited use did not provide financial justification for purchase of the machines.

Professional fees

Any discussion of income immediately raises the question of professional fees. Data concerning fees were collected and showed a rather wide range as well as great diversity of method in setting fee schedules. A few physicians had made out detailed fee schedules, but most had set only a few specific charges such as that for an office or home visit and a fee for obstetrical delivery. In these instances, the fee for an office visit was frequently the same whether or not an injection was given or some laboratory test performed. The usual fee for such an office visit was about $3. There was no evidence that these physicians increased their fees for wealthier patients, but charges were frequently scaled down for patients who were less able to pay.

In general, fees tended to be quite modest. Only one or two instances of patent overcharging were seen. Most physicians manifested little preoccupation with fees or collections; very few knew the percentage of fees collected. The usual practice was not to send monthly statements, the attitude being that those who could pay would do so of their own volition. Collection agencies were usually frowned upon.

DISCUSSION

General practitioners in North Carolina receive ample material reward for their labors. There was little or no evidence of fee gouging or unnecessary use of professional equipment in an effort to increase income or amortize the cost of such equipment. Indeed, most physicians used their radiographic and other expensive equipment so infrequently that one can only conclude that in many instances these machines represented a financial burden to the physician.

A few of the factors influencing the general practitioner's net income have been identified but the most important ones are as yet unknown. The physician's age, type of his practice, the location of his practice and association with one or more other physicians have definite effects. However, there is no linear relation between the quality of his practice and his income.

XI: The Patients and Their Diseases

INTRODUCTION AND METHODS

IN THE FIRST chapter it was noted that there is some difficulty in defining the field of general practice. There is no characteristic and agreed program of training for it, nor is it limited by the conventions and patient selection which characterize specialty fields. In an attempt to get more information about general practice it was deemed necessary to collect data on the patients who visited general practitioners as well as the diseases which brought them. For this purpose the doctor was asked to fill out a short form for each patient (Appendix III). The information requested included the patient's name or initials, age, sex, race and diagnosis. The doctor was also requested to indicate by checking the appropriate item whether the patient confronted him with a new illness or whether the patient had previously been seen by him during the course of that particular disease. In addition an attempt was made to get more specific information about the nature of the general practitioner's job. Thus he was asked to indicate whether he treated the patient in his office, at the patient's home, the hospital or elsewhere. He was also asked to check the organs examined and the laboratory work performed on each patient. Each physician was asked to keep records of all patient visits during the course of one week. Since the study was conducted over a period of one year and extended to all parts of the state in a random sequence, the results should be representative for general practice in North Carolina.

RESULTS

Sources of error

There are certain limitations on the accuracy of data gathered in this manner. The most obvious is under-reporting. Most of the physicians filled out forms on each patient with commendable diligence. However, even the most conscientious physicians in the hurry and bustle of daily practice forgot or neglected to fill out forms on some patients. A few physicians kept records during the period of the observer's visit but stopped keeping records as soon as the observer had departed, so that the results presented are minimal figures. The records pertaining to the extent of the physician's physical and laboratory examination were often judged to have been too extensive. In the observers' opinions these were not filled out with sufficient accuracy and consistency to merit their use for any extended comparisons. Other possible errors will be considered in connection with specific items.

Morbidity in general practice

Ninety-one physicians kept records of the patients they saw during the week in which they were visited. Two physicians were in industrial practice and records of patients in these practices were not regarded as sufficiently typical for inclusion. A single doctor whose practice was visited for a single day kept no records. The remaining 91 physicians supplied data on 15,419 patient visits.

The limitations on the accuracy of morbidity reports are well known, even where such reports are obtained directly from the physician. The material which has been presented previously on the quality of medical care rendered should make this problem fairly clear. In some of the practices in which the history taking and the physical examination were very cursory diagnoses were made on little evidence. Even in the best practices where careful histories and physical examinations were done, clinical diagnoses were not exact, but the probability of a diagnosis being correct was considerably enhanced. Variability in accuracy of diagnosis is not unknown but it has been strikingly emphasized by the observations made in the practices where these morbidity statistics originated.

These morbidity data were originally classified on the three-digit code of the International Statistical Classification of Diseases, Injuries and Causes of Death (Sixth revision).[1] For reasons of space and also because it was not felt that such a detailed classification was justified by the accuracy of the reporting, the intermediate list of 150 causes of morbidity and mortality has been adopted for presentation. To this list of 150 have been added 19 items encompassing reasons other than disease for patient visits to physicians. These include such things as visits for routine examinations, well child care, prophylactic medications, etc. Only primary diagnoses are shown. The results are presented in Appendix V. The varied nature of the pathology confronting the general practitioner is evident from it. Outstanding are the number of patients with upper respiratory infections. 1,573 among a total of 15,419 patients or 10.2 per cent were diagnosed as having upper respiratory infections and about 18 per cent of the patients were treated for respiratory diseases of all types. The second most frequent demand upon the doctor's time was made by pregnancy and attendant problems. Injuries of all types were next in frequency and accounted for almost 9 per cent of patient visits.* The low incidence of emotional disease that was reported is regarded as a serious underestimate. The smallest categories were those containing diseases peculiar to early infancy and neoplasms. Only about half of the latter patient visits were for malignant tumors.

In Table 40 specific diagnoses that were made 100 or more times are shown. Substantial numbers of diagnoses had to be classified in the so-called "waste-basket" categories. The number of diseases shown here may there-

1. Bulletin of the World Health Organization, Supplement I (1949)

*No single injury accounted for as many as 100 visits; however, "injuries" as a category bulked large in morbidity calculations.

fore represent considerable underestimates of the real incidence of specific diseases shown. There were, for example, more unspecified anemias than were diagnosed as to type. Diseases listed here comprise almost half of the morbidity seen by the general practitioners. It will be noted that the detailed classification of morbidity is being used here in contrast to Appendix V in which a less detailed list of 150 disease categories was used for tabulation.

TABLE 40

Diagnoses Accounting for 100 or More Patient Visits

Diagnosis	No. of Visits	Rate per 1,000 Visits
Prenatal visit, normal pregnancy or possible pregnancy	1124	72.9
Postpartum care without complications	312	20.2
Well baby and child care (0-5 years)	428	27.7
Medical examinations (check-up)	367	23.8
Asthma	165	10.7
Diabetes mellitus	127	8.2
Obesity, not specified as of endocrine origin	119	7.7
Anxiety reaction without mention of somatic symptoms	173	11.2
Psychoneurosis—all types	218	14.1
Otitis media without mention of mastoiditis	139	9.0
Arteriosclerotic heart disease, including coronary disease	238	15.5
Essential benign hypertension without mention of heart	366	23.7
Acute nasopharyngitis (common cold)	269	17.4
Acute pharyngitis	254	16.5
Acute tonsillitis	346	22.4
Acute upper respiratory infection of multiple or unspecified sites	870	56.4
Influenza	181	11.7
Acute bronchitis	124	8.0
Bronchitis unqualified	120	7.8
Gastro-enteritis and colitis, except ulcerative, age 4 weeks and over	180	11.7
Cystitis	130	8.4
Infective disease of uterus, vagina and vulva	197	12.8
Disorders of menstruation	127	8.2
Menopausal symptoms	226	17.2
Delivery without complication	151	9.8

Classification of morbidity by medical specialty

In view of the findings presented in Chapter III to the effect that the quality of the physician's work seemed to be determined to some degree by the amount of training he had received during his internship and residency in internal medicine, an attempt was made to break down the patient visits by the medical specialty in which their diseases would normally

fall.* The decisions as to where the diseases should be allocated were made on the basis of where the diagnosis and treatment of a particular disease is usually carried out in a general hospital. Where this proved to be difficult, the additional criterion of the service where a disease was characteristically taught in medical school was considered in allocating it. Medicine and pediatrics were combined for the purpose of this classification since they deal with essentially similar problems by similar methods. The characteristic diseases which are handled and taught only on pediatric services and which have no counterpart on medical services were reported infrequently. The results of this allocation are shown in Table 41. This table also shows the patient visits in terms of the population of doctor's place of practice, since this appeared to influence the distribution of morbidity. The large number of patient visits allocated to the medical-pediatric services is immediately evident, and this can be readily confirmed by casual inspection of the tables of morbidity presented above or in the appendix. About 85 per cent of all of the patient visits are concerned with problems that are medical, surgical or obstetrical, with the rest being allocated to all other specialties. The allocation of diseases to these various specialty categories involved judgments and opinions. Other persons performing such a separation might get different results but it is unlikely that the preponderance of medical (and medical-pediatric) conditions could be abolished altogether. As stated previously, it is believed that the proportion of psychiatric disease is underestimated. This is particularly true if minor somatic diseases involving considerable anxiety and tension are included. The situation of the observer in each of these practices was such that it was impossible to make any valid judgments as to the extent of emotional disease and it is quite futile to speculate as to what the possible true incidence may be. Other specialty fields are not directly represented in a morbidity classification but are nevertheless employed in practice. In about 3 per cent of patient visits, X-rays were employed for diagnostic purposes. About 15 per cent of patient visits were for preventive care. These included prenatal and postpartum visits, well-child care, check-ups, immunizations and administration of other prophylactic measures.

Influence of place of practice on morbidity

It will be noted that the variation in allocation of disease from specialty to specialty by place of practice is not great. Most of the surgery performed in general practice is minor, dealing with bruises, cuts, abrasions, minor burns, and less with fractures and dislocations and more serious maladies. The concentration of surgery among physicians practicing in towns of 1,000 up to 10,000 population is in accordance with the observations made during the course of this study. These were the towns where most of the general practitioner-surgeons were found and the larger amount of surgical

* Dr. Charles E. Flowers, Jr., Associate Professor of Obstetrics, Dr. Warner H. Wells, Associate Professor of Surgery, and Dr. Roger W. Howell, Professor of Mental Health at the University of North Carolina, assisted in making decisions about where the various disease categories should be placed.

TABLE 41

Percentage Distribution of Patients by Type of Problem and Population of Physician's Place of Practice

Type of Case	Population of Place of Practice: Under 1,000	1,000-2,499	2,500-9,999	10,000-49,999	50,000 and over	Total
Medical-pediatrics	63.7	55.4	57.8	55.1	48.9	56.9
Surgical	12.6	20.7	15.2	12.4	10.7	15.6
Obstetrical	10.8	8.9	11.6	17.7	23.1	12.6
Gynecological	4.8	4.6	4.4	4.4	3.8	4.5
Ophthalmological	0.2	0.5	0.5	0.2	0.0	0.4
ENT	0.9	1.0	1.4	1.0	0.7	1.1
Dental	0.8	0.9	0.6	0.7	0.2	0.7
Dermatological	1.7	2.2	2.7	2.9	2.2	2.4
Psychiatric	3.0	3.2	3.4	4.5	5.3	3.6
Unknown	1.2	2.2	2.1	1.0	4.8	2.0
Totals	100.0	100.0	100.0	100.0	100.0	100.0
Average number of patient visits per doctor per week	172.8	207.0	183.2	141.3	100.3	169.4

disease found here represents the performance of major surgery. It was somewhat surprising to find that in towns of over 10,000 an increasing proportion of the physician's work was devoted to obstetric care. In towns of over 50,000, this appears quite marked. However, this figure (23.1%) is inaccurate owing to inclusion of rates from two practices which were largely limited to obstetrics.

The bottom line of this table shows the average number of patient visits per doctor in each size of community. With the exception of the physicians in the smallest towns who have average size practices, the number of patients visiting the physician appears to diminish as the size of the town in which he practices increases. This almost certainly is the result of increasing numbers of physicians in relation to population in larger population aggregates. It should also be noted that the average number of patients seen by physicians in towns of over 50,000 and those in towns of 1,000 to 2,500 are antipodal and significantly different from the mean.

Frequency distribution of patients by physician

In Table 42 the frequency distribution of patient visits is shown by physicians. There were two physicians who had recently recovered from illnesses at the time their practices were visited. One of these physicians reported one patient during a week and the other reported nine. At the other end of the scale, one physician reported 505 patients, but even this was an underestimate since he ran out of recording forms on the sixth day. He presumably therefore saw another 150 patients that were unreported for the week in which he kept records. It will be noted that the mode lay

TABLE 42

Distribution of Physicians by Number of Patients Reported in One Week

No. of Patients Reported	No. Physicians	Percent
0 - 49	4	4.39
50 - 99	16	17.58
100 - 149	20	21.97
150 - 199	22	24.17
200 - 249	15	16.48
250 - 299	6	6.59
300 - 349	6	6.59
350 - 399	0	0.00
400 - 449	0	0.00
450 - 499	1	1.09
500 +	1	1.09
Total	91	100.00

TABLE 43

Distribution of Patient Visits by Race and Sex

	White		Negro	
	No.	Percent	No.	Percent
Males	5,123	39.56	839	40.12
Females	7,825	60.43	1,252	59.87
Totals	12,948	100.00	2,091	100.00

between 150 and 199; this is also where the arithmetic mean fell. Assuming a 5½ day workweek, it appears that general practitioners in North Carolina see an average of just over 30 patients per day.

Race, sex and age of patients

In Table 43 is shown the distribution by sex and race of patients visiting physicians. It is well known that women are likely to visit doctors more frequently than men and this is borne out by this compilation. Among both Negro and white patients males accounted for approximately 40 per cent of all visits and females 60 per cent, whereas the North Carolina population has 49.6 per cent males. North Carolina has a population of about three million white persons and one million Negroes. It would appear from the patient visits that the Negroes visit the white physician considerably less frequently than do whites in proportion to their presence in the population. However, the concentration of the Negro population in the eastern portion of the state and the proportional sampling of white physicians from all parts of the state may very likely have introduced a bias so that no conclusions can be drawn with respect to the seeming large discrepancies shown in the table. Negro patients would also be expected to visit Negro physicians who were not included in this study.

In Table 44 the distribution of patient visits is shown by the age of the patient. The 1950 North Carolina census breakdown by age is also shown for comparison. It will be noted that the census breakdown is on a slightly different age basis. Since the sample of physicians selected for this study does not represent all doctors and was not selected on the basis of population, conclusions as to population cannot be drawn with any confidence. The comparison presented here with the North Carolina census is regarded as largely illustrative. It will be noted, however, that the patients visiting general practitioners in North Carolina follow the general population age composition fairly closely. Children under one year appear to visit general practitioners frequently, as would be expected. Patients in the 6 to 15 age group appear to visit physicians only half as frequently in proportion to their representation in the population of the same age group. This is the group in which morbidity normally is low. It can also be seen that among older patients there is a tendency to visit physicians somewhat more frequently than would be expected on the basis of their

TABLE 44

Percentage Distribution of Patients by Age

Patient Visits		N. C. Census 1950	
Age	Percent	Age	Percent
Below 1 yr.....	5.7	Below 1 yr.....	2.3
1 - 5.....	8.9	1 - 4.....	10.0
6 - 15.....	9.1	5 - 14.....	20.0
16 - 25.....	16.4	15 - 24.....	17.8
26 - 35.....	18.6	25 - 34.....	15.8
36 - 45.....	14.3	35 - 44.....	13.1
46 - 55.....	10.1	45 - 54.....	9.3
56 - 65.....	8.2	55 - 64.....	6.1
over 65	8.6	65 & over	5.8

representation in the general population. It is of course possible that patients in the older age groups are institutionalized in a high percentage of cases or may come under specialists for their medical care, so that the figure given here would not represent an accurate indication of the amount of medical care being received by older people.

Relation between physician's age and patient visits

The average number of patients seen in a week appeared to decline steadily with advancing age of the practitioner. The seven physicians aged 30 or younger reported an average of 226 patient visits. In the succeeding decades the averages were 165, 179 and 150. The five physicians over 60 years of age reported a mean of 129 patient visits. None of these differences was statistically significant but the linear relationship showed the reality of the trend. Two other factors which are related to patient load showed a similar age trend. These are the physicians' hours of work and income. The number of patient visits also seemed to vary from one part of the state to another. In the east the average number of patient visits was 155.3 per week compared with 164.2 in the Piedmont and 178.3 in the mountain regions. These differences are not significant and may have been caused by the distribution of Negroes or sampling fluctuations although adjustment by month and season of the year was attempted in their analysis.

Other observations of patients seen in general practice

About 45 per cent of the patient visits to the general practitioners were classified as "new illnesses" and the remainder as "old illnesses." The general practitioners do the overwhelming bulk of their work in their offices where about three-fourths of all patients are seen. About 10 per cent are seen in the hospital and a similar number at home. The remainder are seen in a variety of other places, such as institutions, public places, stores and the like. A comparison was made with the patient load of the individual physician and the quality of his work. The most striking difference between any two classes of physicians was between those in Qualitative Rank V, the best, and IV, the next to best, who averaged 138 and 193 patients per week,

respectively. It was felt that this may possibly have provided an explanation for the difference between these two groups both as to quality and net income but insomuch as the difference did not prove to be significant, no meaning can be attributed to it at this time. Otherwise, the average number of patients seen by the physicians appeared to increase with the increase in the quality of their work. These differences likewise did not prove to be significant.

Physicians in group practice were found to have a greater average patient load per week (196 patient visits) than those practicing alone (160 patient visits.) However, the difference was not statistically significant because of the great variation in both groups. Doctors in group practice do not appear to experience the decline in patient load that doctors in solo practice do with advancing age. This was also true for hours of work and income which are probably determined by the patient load. The differences between group and solo practitioners are not statistically significant with respect to any one of these items.

Comparisons of these results with other like studies show many similarities. The several studies of morbidity in general practice in Great Britain have produced results not greatly different from those presented here.[1] A report of a morbidity study performed in the State of Washington shows a distribution of diseases and patients substantially the same as that obtained in North Carolina.[2] A recent study of a single rural North Carolina practice is also in good agreement.[3]

DISCUSSION

In this chapter some of the sickness and demographic facts about the patients visiting general practitioners have been presented. The first and most important fact is that diseases and conditions which bring patients to general practitioners are extremely variable. Most of these diseases are ordinarily regarded as medical. The varied skills which doctors will need in caring for their patients are evident. The medical reader may easily deduce from study of these morbidity statistics that much of the general practitioner's time is taken up with minor and self-limited diseases. Much of it is potentially serious and a small number of patients have diseases which are often fatal or require prolonged care and management.

Attempts to explain the great variation in patient load from physician to physician were not successful. Group or solo practice, the community of practice, the age of the physician all seem to have some influence on the patient load. They fail, however, to explain the greatest part of the variation. It seems likely that some characteristic of the individual physician is important in determining his popularity with patients. It was shown previously that the quality of a doctor's work was not correlated with the

1. *General Practitioners' Records,*" Logan, W.P.D., H.M.S.O., London, England (1953); Fry J., *British Med. J., II:* 249 (1952); McGregor, R. M.: *Edinburgh Med. J., 57:* 433 (1950)
2. "*Why Patients See Doctors.*" Standish, S.; Bennett, B. M.; White, K.; Powers, L. E.: University of Washington Press (1955)
3. Taubenhaus, L. J.; *GP 12:* 97 (1955)

length of his work day. A related finding has been shown in this chapter: the quality of a physician's work shows no association with his patient load. A large practice does not necessarily depress the quality of the work done and a small practice does not result in more careful, methodical histories or physical examinations.

Certain other results presented in this chapter are well known. The excess of women patients is only partly explained by the large number of prenatal and postpartum visits. The excess of patient visits in the very young and the very old are related to the increased morbidity in the latter group and the large amount of preventive care received by the former.

XII: General Summary

THIS STUDY WAS INTENDED as an analytical examination of general practice. It was designed to obtain information about the problems of the general practitioner in the hope that his educational, training and continuing professional needs would become clearer. The development of methods of study that would provide the desired information was necessary. This latter problem was of such magnitude that it became an intermediate goal.

From the outset it was clear that careful, extended observation by clinically trained observers would be required. Such a method is expensive in terms of both time and money, but it was believed to be necessary and it is felt that the results were rewarding. This provided for use of both observational as well as interview techniques. In order that the variations in the quality of medical care could be described and compared, it was necessary to develop criteria to distinguish between individual practices. The criteria which were chosen were based principally upon an evaluation of the physician's skill in making a diagnosis. Standard statistical techniques were used to interpret the observations. It was then possible to make comparisons between individuals and between groups of individuals. While not perfect, this method worked well and provided internally reproducible results.

The problems of the general practitioner are very complex. However, some tentative conclusions have been reached and the way cleared for further work in this field. Some of the shortcomings of professional education and training have been identified and the relative importance of several factors in the physician's professional environment have been evaluated.

Many physicians were performing at a high level of professional competence. Of greater importance is the fact that other physicians were performing at a lower level. It appeared that an important cause of these latter performances was a less comprehensive grasp of the clinical skills necessary to medical practice. This suggests that inadequate clinical training for general practice is a most important factor. Subsequent observations bear this out but also show that it is not the only factor.

Upon examination of the physician's academic performance in medical school and his hospital training, two basic facts emerge. First, the better medical student tends to become a better physician. Second, the more training a physician has received in internal medicine the more likely he is to become a good physician. Individuals do not learn at the same rate and it therefore is unreasonable to expect that all physicians will receive

equal benefit from a fixed training program. Most students in the upper third and upper half of the class appear to acquire the necessary clinical skills quickly; less adept students require a longer period of time for acquisition of these skills and it seems probable that some few will never master them in any reasonable period of time. It appears that some of these slower students can be fashioned into good physicians with sufficiently prolonged training in internal medicine. The importance of training in internal medicine lies not in the name of the discipline or service but rather in its comprehensive viewpoint and emphasis on the basic techniques of diagnosis. These are the core of medical practice. The institutions in which doctors were educated or trained appeared to have less influence than the factors enumerated here.

The findings with respect to academic performance and hospital training suggest two possible avenues of approach to the problem of improving the quality of medical care. One approach would lie in restriction of admissions to medical school (and thereby to the practice of medicine) to those individuals of the caliber of the present "upper third" classification. How to select these individuals from the many applicants has not been solved. This study has shown no relationship between either academic performance or level of practice and the few facts obtainable about the doctors' family and community backgrounds. Unfortunately, the great variety and occasional scantiness of undergraduate records prevented any conclusions as to their influence. An examination of the Medical College Aptitude Test scores which were available for some physicians did not indicate that they were of great predictive value. Further investigation into this problem is indicated in the hope that more consistent and reliable principles of selection may be evolved. A second approach to improving the quality of medical care would be to increase the length of training to that point at which a given physician, regardless of academic standing, achieves clinical competence. Since the successful student cannot be identified with certainty the second approach would appear to offer more promise of success. The concept of arranging or prolonging programs to fit the needs of the individual trainee would, of course, be contrary to the present practice of fitting groups of interns into established programs.

This discussion turns, inevitably, to a consideration of the physician as an individual: his interests, his motivations, his attitudes and responsibilities toward the profession, his patients and society in general. These factors of necessity must exert considerable influence on the level of medical care which he renders. Indeed, this theme can be sensed in varying degree throughout nearly all the results presented in this report. Likewise, these same characteristics might be expected to affect the diligence with which he pursues his studies in medical school as well as the attempts he makes to secure adequate training for his subsequent role of family doctor. The observed influences exerted by education and training in internal medicine fail to explain all the observed variations in quality of practice. The differences in individual interests and motivations undoubtedly have a considerable influence and probably provide a partial explanation as to why

some poor medical students become very good practicing physicians.

Advancing age was associated with a lower quality of work, a narrower scope of practice, less postgraduate study, fewer hours of work, lower income and a smaller patient load. As this was a cross-sectional study, it cannot be categorically stated that these differences are not static ones but the distinct linearity of the trends tends to substantiate the belief that these are dynamic continuing changes characteristic of all doctors. However, in spite of the group trends some of the older physicians showed a keenness and apparent interest in medicine which was more often associated with younger, more vigorous physicians. With advancing years and increasing remoteness from medical education, interest in many and varied things outside the practice of medicine becomes more pronounced. This offers a partial explanation for the general decline which is not shared by those who appear to maintain an active intellectual interest in medicine.

The individual physician has less influence over his education and training than he has over the organizational and environmental features of his own practice. He selects his practice location, chooses his office, determines the number and qualifications of his office personnel and chooses his equipment. Within certain limits he is able to arrange his hours of work and regulate his patient load and income. Attendance at postgraduate courses, hospital and society meetings and the reading of journals also are largely dependent on the individual's initiative. Many of these factors were found to bear no relation to the quality of medical care rendered. Those which did appear to have some association (good laboratory facilities, provisions for patient comfort and convenience, journal purchase habits, employment of trained technicians, etc.) may reflect the physician's interest in his work, rather than being determinants of his level of work. Group or partnership practice with its usually better quality of work also appears to reflect the doctor's interests and motivations in making practice arrangements.

While the individual physician has considerable choice in selecting a community and shaping his practice, it is unreasonable to believe that the environment does not in turn exert its influence on him. A hint of this may be found in considering group or hospital practice, scope of work or community size. There are almost certainly other environmental effects that were not measured.

Several areas for further investigation are indicated by the results of this study. Identification of the attributes and characteristics of the individual who will make a successful student and practitioner of medicine presents a formidable problem but is of such importance that an attempt in this direction is justified. Tentative studies in this field have been initiated.

The observed effect of training in internal medicine on the quality of a doctor's work warrants confirmation and amplification. A further study has been designed to provide additional information about this relationship as well as more definite evidence relative to the effects of prolonged training in internal medicine.

This study also points to the need for further study of some related questions. The suggested favorable influence of practice in association with a partner or a group needs further investigation. The nebulous influence of postgraduate study on the physician's performance suggests that a reappraisal of the methods employed in postgraduate courses is overdue. Experimentation with hospital organization and supervision which would achieve benefits for the general practitioner rather than leave him unaffected or merely restricted seems justified.

Appendix Section

Appendix I

Creation of the Population and Statistical Procedures

Creating the population

The population from which the sample was drawn was made up from several sources. The primary source and the one which was found to be the most reliable and accurate was the Directory of the Medical Society of the State of North Carolina. The 1952 Directory, issued in the summer, was the latest available so the preparation of the population was based on it even though the work began almost one year later (July 1953). By good fortune a second tabulation of the physicians of North Carolina was available from the Commission on Financing of Hospital Care, a study group sponsored by the American Hospital Association. This committee, under the immediate direction of Graham Davis, had undertaken studies of hospital financing in North Carolina in 1951 and in the course of study an attempt had been made to ascertain the physician resources of the state by means of a questionnaire sent to the secretary of each county medical society. The listing compiled from this data contained the names of all of the doctors in the state as well as certain data about each physician, including his type of practice. The 1950 American Medical Association Directory of Physicians was also used for reference.* Local telephone directories were frequently used since many contained listings by type of practice. If there were any indication from any of these sources that the doctor might be engaged in general practice, or in the event that he was not specifically designated as specialist in all sources, he was regarded as a general practitioner, and a card with his name and appropriate data for identification was made.

In creating the population a total of 1,870 doctors was considered, including all doctors who for any reason might be considered to be general practitioners. The physicians excluded were those with specialty listings as well as doctors in institutional practices, in veterans' hospitals, in the armed services, in medical schools or in training programs. Any circumstances that might cast doubt on a specialty designation resulted in the inclusion of the doctor. From the 1,870 possible general practitioners, a total of 315 were eliminated because the physicians were over 65 years of age. The reason for this is discussed later. This left a population of 1,555 to be sampled.

The study and the sample were limited to white physicians. There were several reasons for the exclusion of the Negro physicians. The most important consideration was that the 1950 census listed only 180 Negro physicians in the whole of the state and the directory of the Old North State Medical Society, an organization of Negro physicians, listed about 150. The number of active physicians was in all probability somewhat less than the latter figure. An adequate sample of the Negro physicians in each cell of stratification would have consumed a disproportionate amount of the research effort and it was therefore deemed impractical to include them. In addition, the problems of segregation made it extremely unlikely that a white physician could have occupied the same position of observer in the office of a Negro physician as was done in the case of the study detailed here. Negro physicians furthermore are probably atypical in a number of ways. Their exclusion until recently from the state and county medical societies and the educational and organizational opportunities which such membership provides, the lack of hospital appointments, and a number of other factors all dictated their exclusion.

The sampling procedure

A number of factors of potential importance were considered in stratifying the

*This directory was also found to be very accurate but its earlier publication made it less valuable for purpose of this study.

population of physicians before selecting the sample. One of the most obvious facts about North Carolina is that it consists of three geographic areas, the Mountains, the Piedmont and the Coastal Plain. It was not known whether the doctor's location would materially alter the form of his practice, but there seemed to be a feeling among physicians that the mountainous portion of the state presented a particularly difficult place to practice from point of view of travel, facilities and economics. The preliminary study which extended to this area gave no evidence that these problems were overwhelmingly important but it was felt necessary to give consideration to opinions of practicing physicians. The Coastal Plain, on the other hand, has a high proportion of the state's Negro population and consequently would be expected to have a different patient population. Allowance was therefore made for these areas in stratifying the sample. In subsequent study it was found that practice did not differ significantly from one part of the state to another so that throughout the report this division is not usually considered.

Another factor thought to be of possible importance was the medical school from which the doctor had been graduated. To avoid any possible bias related to medical education, the medical schools in the United States were divided into two classes, good and outstanding. Almost all American medical schools now conform to an acceptably high standard, but there is a small group of medical schools which are outstanding in terms of their resources, clinical facilities, staff, research, as well as in other aspects. It may be argued that possession of excellent research facilities or outstanding personnel in one or another field may not be perfectly correlated with the excellence of its medical teaching. While this argument may have some weight it seems almost certain that more extensive facilities and staff do provide greater opportunities for students to learn. Perhaps a more important factor is the larger number of applicants to certain schools which are thus able to be more highly selective than other schools with fewer applicants. The research group was fortunate in obtaining help from authoritative sources in making this division of medical schools. Questions of bias with respect to medical school as well as other aspects of medical education have arisen frequently so this stratification of the sample was amply justified.

A third factor which was considered in stratifying the sample was the location of the doctor's practice with regard to population density. It was thought that practice in rural or urban areas might have opposite influences on the facilities and problems of practice. In defining "urban" and "rural" the 1950 United States Census of Population rule with respect to this classification was followed. According to this, places with less than 2,500 inhabitants were defined as rural and those with 2,500 or more, as urban.

Finally, the doctors were divided into various age groups. Doctors 65 years of age and older at the initiation of the study were excluded from the population for several reasons. A previous study has shown that doctors in the higher age groups do substantially smaller amounts of work than younger physicians.[1] In addition it was anticipated that if this group of doctors was sampled, a large number of doctors would be encountered who were very nearly retired or had very small practices. Another fact of importance in making this decision was that doctors in the older age group are products of medical education of a very different sort than that of the present time. Most of the physicians over age 65 were graduated from medical school before 1913 when proprietary and other medical schools of extremely poor quality were numerous. The fact that there were only 243 physicians (9.8 per cent of the total) in this highest age group listed in the 1950 census made this decision considerably easier. Among the physicians under 65 years of age in 1952 three divisions were made. One group consisted of physicians from 50 to 65 years of age and another of doctors aged 49 years or less. The latter group was subdivided again into physicians who had been graduated from medical school in 1946 or earlier and those whose graduation occurred between 1947 and 1951.

The stratification of the sample on the basis of the factors given above resulted in the creation of 36 cells (3 for area X 2 for medical school X 3 for age X 2 for place of practice). By selecting a constant percentage of all general practitioners in each cell, there would be no need in sub-

1. Crocco, A., *J.A.M.A., 121:* 506-513 (1943)

sequent calculations for weighting in relation to the proportions of the various groups selected. A rule was made that at least two physicians from each cell were to be observed so that an estimate of variation could be made for each subdivision.

Initially a sample of one in 16 was adopted with the additional rule previously noted that at least two names must be drawn from each cell. In one of the 36 cells there was only a single physician available in the population. Three cells contained no physicians. The sampling ratio therefore varied between 6 and 100 per cent in the cells which could be sampled.

Upon investigation it quickly became apparent that many of the physicians whose names were drawn were not in general practice; of the 117 physicians drawn at the initial sampling, 50 were ultimately eliminated. A second subgroup of 30 names was then drawn and the physicians were immediately investigated. It became apparent that a large proportion of these would be eliminated as before, so a third sample of 26 names was drawn, bringing the total number sampled to 173, or 11.1 per cent of the total population of 1,555 physicians who were probably or possibly general practitioners.

During the course of the survey a revision was made in the classification of the medical schools as described. While the revision affected only a few physicians, the reclassification had the effect of giving some cells enough physicians and made it necessary to sample other cells more heavily.

Tests for significance

The methods employed throughout this study for testing the statistical significance of the observations to rule out the possibility of chance happenings consisted of standard procedures. These included contingency X^2 corrected for continuity, t — test for difference between two means, analysis of variance and covariance, t — test for significance of regression and correlation coefficients, and nonparametric procedures such as the sign test. Results stated as statistically significant were such that the probability of their occurrence by chance alone was always 5% or less. In some cases, the exact probability was stated.

Definition of general practice

Each doctor was investigated thoroughly before being eliminated from the sample for any reason. Naturally a definition of general practice was an early requisite. A man who had had no specialty training and did not limit his practice to a single field would be described as a general practitioner without question. Actually most of the physicians fitted this description. On the other hand, a doctor who was board certified in a specialty and limiting his practice to a given specialty was clearly a specialist. In a few cases physicians were encountered who did not fall into either of these categories. Physicians who were "board eligible" or had training very nearly sufficient to make them "board eligible" and who limited their practices to single fields were for the purposes of this study graded as specialists. The definition of a specialist was based mainly upon the individual's training, and extensive training was, fortunately, almost always associated with limited practice. There were several physicians whose training was sufficiently extensive so they should have been classified as specialists by this single criterion. Upon visiting these physicians it was found that they did not limit their practices to single fields so they were classified as general practitioners. For example, one physician with specialty training and with the bulk of his practice devoted to a single field was included because he did not restrict his work completely. Another doctor, whose training consisted only of a rotating internship, practiced almost exclusively in a specialty field but was nevertheless included in this study since by training he was not a specialist and thought of himself as a general practitioner. About half of the persons eliminated because of specialization were determined to have board certification.

The list of reasons for deletion of physicians from the study sample is given in the accompanying table. (next page)

From the outset of the study an attempt was made to trace each member of the sample and when possible visit him personally but the amount of work involved proved to be too great. Therefore a letter was sent to each doctor requesting verification of the fact that his practice was limited to a single specialty or that he no longer

Primary Reason for Deletion	No.
Practice limited to specialty	31
No longer in North Carolina	18
Deceased	5
In medical education	5
In armed forces	4
In institutional practice	2
Retired	1
Total	66

resided in North Carolina and did not intend to return to North Carolina at an early date. It was possible to trace or contact every physician whose name was drawn with the exception of one woman physician; no information could be obtained from her former place of practice or in the North Carolina Medical Society files or upon inquiry to the American Medical Association. It might be noted that a number of doctors were eliminated for more than one reason. Many physicians were out of state and were also specialists or in training. Among the physicians in medical education, some were doctors in training and a few were on the staffs of medical schools.

One physician whose name was drawn in this sample was found to be located outside of the State of North Carolina. However, the town in which he practiced was only a few miles from the border. A considerable portion of his practice was drawn from North Carolina, he held membership in the North Carolina Medical Society, he was on the staff of a North Carolina hospital, and was in general practice; therefore, he was included in the sample. The other 18 physicians who were no longer in North Carolina were all far removed.

The elimination of 66 physicians left 107 who, on the basis of the criteria stated above, were regarded as general practitioners. Of this group all were invited to participate in this study but for various reasons 13 could not be included. Five of the 13 general practitioners were ill or retired from the practice of medicine. One of these physicians stated that he had a coronary thrombosis and was limiting his work almost entirely to administering anesthesia. His office was visited on several occasions during the normal working hours but the doctor was never found there. A second physician was found to be ill and the nature of his illness was such that it was felt that it would not be wise to seek his cooperation in this study. A third physician suffered an acute myocardial infarction two days before he was to be visited for purpose of inclusion of this study. A fourth physician who was obviously ill was tending his practice only part-time and irregularly. These two latter physicians would have cooperated had they been pressed to do so, but this could not be done in good conscience. The fifth physician in this group had a myocardial infarction six months previously and had never re-entered practice.

There were eight physicians who felt they were unable to participate in this study. Two of these physicians did offer to cooperate at some later date and it is possible that, if the study could have been extended a sufficiently long time, they might ultimately have done so. There were six physicians whose refusal to cooperate was unconditional. Many reasons were given for not being able to cooperate. It is difficult to judge what effect their inclusion would have had on the results; casual impressions were found to be most misleading in judging physicians.

Appendix II

General Practice Questionnaire

DATES OF VISIT

1. Name of Doctor_____ Age_____
   Address_____

2. The Family and Community Background of the Doctor
   A. Father's Occupation_____
   B. Mother's Occupation_____
   C. Remarks
   D. Place of Birth_____ State_____
      On a Farm_____ or in Town_____
   E. Other Places Lived In
      Place_____ Farm or Town_____ Ages_____

3. Marital Status
   Single_____ Divorced_____ Separated_____
   Married_____ Widowed_____ No. of Children_____
   (Check and fill in appropriately)

4. Premedical Education, Medical Education, Internship and Residency
   A. Years Premedical Training_____ Degree_____
   B. Medical School (s)_____ Years_____
   C. Internship*
      Hospital_____ Type_____ Place_____ Years_____
   D. Residency
      Hospital_____ Type_____ Place_____ Years_____
   E. Internship and Residency Breakdown

Service	*Total Months*
Surgery	
Medicine	
Pediatrics	
OB-GYN	
Psychiatry	
ENT	
Other (Specify)	

*Question 4: C. In determining the type of internship the following will serve as criteria:
Rotating—medicine and surgery plus three or more other services.
Mixed—one in which at least half of the period is spent on one of the major services.
Straight—one in which the entire period is spent on one service.
(Definitions taken from *JAMA 151:* 579-585 (1953))

5. Satisfaction with Medical Training
   The following questions should be asked:
   1) Do you feel that your training in medical school fully prepared you for your work as a general practitioner?
   2) What was omitted that you feel you needed?
   3) What was included that you feel could have been abbreviated or omitted?

6. Practice Experience
   A. Place_____ Type_____ Years_____
   B. What were reasons for leaving previous locations?
   C. Why did he choose present location?
   D. What factors caused him to stay here?
   E. Does he like this area as a place for a general practitioner to practice?
   F. Army service (description and value)
7. Present Practice
   A. Location of practice (by region, community and location in community)
   B. Predominant social or occupational classes of patients
   C. Medical characteristics of practice

8. Why Did He Go into General Practice?

   It is suggested that the following questions be asked:
   1) When you were in medical school did you think of going into general practice?
   If the answer is "yes" the second question will be:
   2) Why?
   If the answer is "no" the second question will be:
   2) Why didn't you plan to go into general practice? and
   3) What happened to change your mind?

9. Satisfactions and Dissatisfactions with General Practice.

   It is suggested that this question be asked: "Are you glad that you went into general practice?" The "why" and "why not" can be asked thereafter.

10. Number of Doctors Practicing in County.
    A. General practitioners, fully active, number_____
       reduced activity, number_____
       inactive, number_____

    B. Specialists (numbers)
       Surg._____Med._____OB-GYN_____ENT_____Ped._____Radiol._____
       Path._____Urol._____Other_____

11. Physical Plant
    A. Location and description of office_____
    B. Examination and treatment rooms_____
    C. Equipment_____
    D. Clinic Patients rooms, type:_____
       Number of beds_____Number of bassinets_____
    E. Delivery room (s)_____
    F. Operating room_____

12. Auxiliary workers
    A. Number and Qualifications
    B. Usual Duties

13. Laboratory
    A. Room (s) description_____
    B. Equipment_____
       Refrigerator_____Microscope_____Centrifuge_____EKG_____BMR_____
       Colorimeter_____Others_____
    C. Procedures (specify methods where pertinent, e.g., hemoglobins—check procedures actually performed)

Urines	Stools—parasites
Hemoglobins	blood
RBC	Cultures
WBC	Rh typing
Differentials	Cross Matching
Sed. rates	Bl. glucose
BUN	Blood typing
Other	STS

D. Technicians (Qualification and training)

14. X-ray

A. Make_____ Capacity_____ Model_____

B. Qualifications or training of operator_____

C. Fluoroscopy

(Indicate use of or not use of by "yes or "no"):

Apron_____Gloves_____Screen_____Observed accommodation time_____

D. Type of work done (check appropriately)

Chest_____long bones_____sinuses_____GI series_____KUB's_____

IV Pyelograms_____BA Enemas_____BA Swallows_____Gall Bladder_____

Other_____Fluoroscopy_____

E. Interpretation (Who did interpretations? Qualifications?)

F. Need for X-ray in general practice (Physician opinion)

G. Filing of films and records

15. Records (Description)

16. CLINICAL ROUTINES FOR DIAGNOSIS AND THERAPY

(The following should be applied to new patients, patients with new illnesses, patients requesting a check-up, or to patients whose complaint, sex, age, race, childbearing history, appearance or attitude would indicate the need for careful history and examination. Credit should be given for good regional examinations where these are clearly indicated and where the doctor's previous contacts with the patient have been sufficiently frequent to justify a partial history or physical. Where specific tests are omitted by the physician for good reason "N.A." (not applicable) should be entered in the margin beside the procedure in question. The doctor, for example, who does no OB should not be graded on the OB question. The reason for writing "N.A." should be given.)

HISTORY (Indicate weight in boxes)

0–10 Points should be given if history is limited to the presenting complaint or the involved organ. If the history is non-existent the value assigned should be 0. Questions as to periodicity, duration, severity, location and other questions largely limited to the patient's presenting complaint may raise the grade to a maximum of 10.

11–20 Points will be given for fair histories. Histories in this class should indicate that the doctor is giving attention to the organ involved and the possible diagnosis and complications. Some questions as to past history and the major organ systems should be asked. The incompleteness, the lack of knowledge, lack of interviewing skill serve to distinguish histories in this class from those in the next higher.

21–30 Points should be given for very good history taking. Histories graded in this class should give evidence that the doctor is thinking in terms of the organ involved and the possible complications. There should be evidence that the doctor is thinking of all possible diseases and is trying to assess these by his questioning. Classification in this group should be limited to doctors who elicit some past history and who determine the presence or absence of symptoms in the major organ systems other than that involved in the presenting complaint. Skill in interviewing should be given credit here. Clinical knowledge is evident in history taking and credit should be given where it is obviously extensive.

PHYSICAL EXAMINATION

DISROBING FOR EXAM	0	Exam performed with patient dressed or almost completely dressed
	1	Patient sufficiently undressed as to allow easy access to parts being examined
EYES	0	No examination or examination limited to inspection of conjunctivae
	1	Examination of conjunctivae with occasional determination of visual fields or pupillary reactions or extra-ocular movements
	2	Complete examination of visual fields and pupillary reactions and extra-occular movements in addition to examination of conjunctivae
OPHTHALMOSCOPE	0	Never done
	1	Performed occasionally
	2	Performed with frequency indicated by clinical conditions
EARS	0	Not examined with otoscope
	1	Examined with otoscope only
	2	Otoscopic examination plus hearing test: watch or whisper perception or bone vs. air conduction
NOSE	0	Not examined when indicated
	1	Examined
MOUTH	0	Inspection of tonsils or throat only
	1	Complete inspection of mouth, tonsils and throat including teeth and gums and tongue
NECK	0	Not examined
	1	Examination limited to submaxillary nodes
	2	Examination includes lymph nodes, thryoid gland, mobility of neck
LYMPH NODES (Axillary, inguinal, epitrochlear, post cervical	0	Never done
	1	Done in part
	2	Examined completely
CHEST	0	Not done
Percussion	1	Chest thumped perfunctorily
TACTILE	2	Percussion over all major lobes, determination of diaphragmatic level, diaphragmatic movements
FREMITUS	0	Not done when indicated
	1	Done when indicated
AUSCULTATION	0	Not done or performed through clothes
	1	Only part of chest auscultated (e.g., single area in front or back)
	2	All lobes auscultated with apparent care
HEART	0	Auscultation of base or other single area of the heart
	1	Adequate auscultation of all areas plus percussion of heart border *or* palpation of heart
	2	Good complete examination of heart including auscultation, palpation and percussion
BLOOD	0	Systolic measurement only
PRESSURE	1	Careful systolic and diastolic measurements
	2	Careful systolic and diastolic measurements together with palpation of peripheral pulses when indicated or blood pressure determination in both arms
ABDOMEN	0	No examination or examination with the patient sitting or standing
	1	Examination with the patient lying down but done in a perfunctory fashion

	2	Examination with careful palpation of liver, spleen, and in all areas. Examination for costovertebral tenderness, examination of genitals and palpation of inguinal rings, auscultation when indicated
NEURO-	0	No examination
LOGICAL	1	Examination limited to elicitation of knee and ankle jerks only
	2	Reflexes tested in all extremities. Other neurological tests performed when indicated – Romberg, Babinski, cranial nerves, strength of various muscle groups, Kernig's sign
EXTREMITIES	0	No examination
	1	Adequate inspection, palpation, testing of motion
RECTAL	0	Not usually done
	1	Done
VAGINAL	0	Not usually done
	1	Bimanual examination including visualization of cervix through speculum
	2	Examinations performed carefully, thoroughly and include diagnostic measures such as smears, "pap" smears and biopsies
BREASTS	0	Not examined routinely
	1	Examined as part of a general physical examination

OVER-ALL SKILL

0
1
2
3

COMMENT: In the foregoing characterization of the physical examination it may be just to revise the result up or down. Up to three points may be added to the score for general excellence as evidenced by frequent performance of complete examinations, by detection of a minimal murmur, use of a proctoscope or other special diagnostic procedures. The reason for giving extra points should be stated below.

Conversely the score can be assigned realistically where this is indicated. Examples already observed will serve.—The doctor who continues to talk while he auscultates a chest or who misses a clear abnormality in performing his exam should not receive credit for such work even though he is going through the form of a complete examination. Where such down grading is done it should be noted and the reason stated in the margin beside the examination involved.

LABORATORY PROCEDURES (check appropriately)

The following refers to procedures done in the doctor's office or for which the doctor refers the patient elsewhere. If referral is done for good indications credit should be given for this.

URINES	0	Not done or rarely done
	1	Frequent examinations for albumin, sugar and microscopic
	2	Carefully collected urines adequately centrifuged, attention given to such items as specific gravity, color, etc., proper use of reagents, in addition to examination for albumin, sugar and sediment
HEMOGLOBIN	0	No hemoglobin determinations or Tallqvist only
	1	Use of Sahli and other simple colorimeter methods
	2	Skilled use of hemoglobin determinations such as screening procedure. Accurate method such as photoelectric colorimeter or carefully done Sahli
WBC	0	Not done
	1	Done as usual procedure when indicated
BLOOD SMEARS	0	Not done
and/or	1	Done
DIFFERENTIALS		
STOOLS	0	Not examined
	1	Examination for parasites or ova or occult blood or cultured when indicated
SPINAL TAPS	0	Never done
	1	Done

RBC	0	Not done
	1	Done
BACTERIOLOGY	0	Never done
	1	Smears such as g.c., diphtheria, TB
	2	Smears done as well as some cultures of blood, sputum, throats
SICKLING	0	Not done
PREPARATIONS	1	Done
X-RAY	0	No use of X-ray, no referral for X-ray, unskilled use of X-ray and fluoroscopy as indicated by improper operation of the machine, performance of procedures beyond the doctor's training and skill
	1	Referred for X-ray, proper operation of X-ray or fluoroscope, limitations on scope of work performed
CHEMISTRIES	0	Not done
Glucose	1	Lilly screening test used
	2	Standard blood glucose performed
B.U.N.	0	Not done
	1	Done
EKG	0	Not done or not done skillfully or not used when indicated
and/or	1	Done competently and correctly interpreted, used for patients
BMR		when indicated
SEROLOGY	0	Not done
Rh	1	Done
S.T.S.	0	Not done or done only in pregnant women
	1	Done as a general diagnostic procedure
BIOPSY OR	0	Not done
PAP SMEARS	1	Done
TUBERCULIN	0	Never done
SKIN TESTS	1	Done
MISC.	0	Some doctors may do a variety of other laboratory tests for which credit should be given. Points should be given for the performance of vital capacity measurements, kidney function tests such as PSP or concentration test, measurement of venous pressures or circulation time, liver function tests, such as BSP, A/G ratio, cephalin flocculation, exercise tolerance with EKG, glucose tolerance, autopsies or others. Credit up to three points should be given for procedures in this class, i.e., one point for each procedure to a maximum of three. Credit will be given only if these tests are competently performed and interpreted. All the tests in this group that are performed should be noted
	1	
	2	
	3	
COMMENTS:		
STERILE	0	Breaks in technique, inadequate sterilization as with alcohol or
TECHNIQUE		merthiolate, use of unsterilized syringes, needles or stylettes.
	2	Adequate boiling (15-30 min.) or autoclaving of syringes, needles or stylettes
THERAPY (Check appropriately)		
UPPER	0	Antibiotics given indiscriminately to all patients or most patients
RESPIRATORY	1	Attempts made to separate viral and bacterial infections for pur-
INFECTIONS		poses of therapy
ANEMIAS	0	"Shot gun" preparations used always
	1	Therapy related to type of anemia
OBESITY	0	Failure to recognize as a clinical problem or dietary advice inadequate
	1	Recognized as a clinical problem, treated by adequate dietary explanation and support of morale
EMOTIONAL	0	Emotional problems not recognized generally and no treatment
PROBLEMS		or unskilled treatment administered

1 Emotional problems recognized but treatment not undertaken or not skillful or for somatic complaints

2 Emotional problems recognized and treated with sufficient competence to demonstrate grasp of treatment methods

HYPERTENSION

0 Assessment of hypertensive disease poor or limited to blood pressure determination only. Management not skilled; neglect of therapeutic procedures such as weight reduction, rest and salt restriction. Drugs poorly selected or administration unskilled.

1 Treatment of hypertension includes assessment of arterial disease as evidenced by adequate examination of eye grounds, urines, blood pressure, heart, search for edema. Management includes weight reduction, care in selection and supervision of treatment (sedation, anti-hypertensive drugs, low salt diet, rest and reassurance).

CARDIAC FAILURE

0 Digitalis, quinidine and mercurials not used with proper indications. Salt restriction not accompanied by adequate dietary explanation. Management not skilled. No attention to weight reduction

1 Intermediate skill

2 Skilled use of digitalis in adequate amounts. Skilled use of mercurial diuretics. Skilled use of low salt diets or salt free diets with adequate explanations thereof. Skilled use of quinidine when used. Management good.

USE OF POTENTIALLY DANGEROUS MEDICATIONS

0 Doctor makes no effort to avoid drug reactions or complications

1 Doctor shows awareness of possible toxicity from a medication. Does he inquire about previous penicillin injections and reactions? Does he provide proper supervision and advice to patients receiving drugs such as Butazolidin or propylthiouracil, ACTH or Cortisone?

OBSTETRICS (Check appropriately)

A. Initial Antenatal Visit

2 Performance of physical examination including examination of eye grounds, careful pelvic with attention to internal measurements, determination of Rh type, STS and hemoglobin level with omission of no more than one procedure

1 Omission of not over two procedures

0 Omission of three or more procedures

B. Subsequent Antenatal Visits

1 At each visit weight and urine are examined, the uterus palpated and later in pregnancy auscultation of fetal heart carried out

0 Omission of any of above procedures

C. Schedule of Antenatal Visits

1 Schedule of antenatal visits, including a postpartum visit approximating that recommended by A.C.M.W. The doctor makes an effort to convince the patient of the necessity of such visits

0 The doctor has no schedule of prenatal visits, omits postpartum examinations, makes no effort to have the patient make prenatal visits regularly or to attend for postpartum care

WELL-CHILD CARE

2 Superior preventive care including a schedule of well-child examination and immunization, education of the parent, employment of special tests such as STS and tuberculins when indicated.

1 Has a schedule of immunizations, makes an attempt to get children immunized, preventive work limited to immunization

0 No effort made to educate parents as to need for immunization

RECORDS (Check appropriately)

0 Only information recorded as medication, fees or isolated data such as BP

1 Scant records with minimal information about positive findings and medications

2 Very good records. This should include all positive items of a history and physical, results of laboratory work including blood pressure, urine and weight, medications or other treatment. Special files on OB, pediatric or other patients, well filled check sheets would tend to place a doctor in this group. Records complete and include home and hospital visits.

17. Limitations on Practice
    A. Special interests
    B. Limitations on cases
18. Consultants
    A. List the location of consultants employed by the doctor

Surg.	Radiology
Med.	Pathology
OB-GYN	Urology
ENT	Neurosurgery
Pediatrics	Other

    B. How and why were these consultants selected and used?
19. Practice Arrangements
    A. Solo _____ Partnership _____
    B. Division of responsibility or interests and cash _____
    C. Arrangements for:
    Time off _____ Vacations _____
20. Other Medical Positions Held by Doctor (Indicate time spent)
    A. Paid jobs
    Industrial _____ Institutions (specify) _____
    Public Health _____ Other _____
    B. Voluntary Unpaid Medical Service
21. Hours of Work

A.	Formal	Observed
Sunday		
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		

    B. Appointment System _____
    C. Effects of Stress on the Doctor _____
22. Hospital Appointments
    A. Hospital Appointments (list) _____

B. Hospital responsibilities and limitations_____

C. Number of patients admitted during period that internist is present.

Remarks (Description of work-ups and diagnoses)

23. Fees

A. Office Visits

B. Home Visits

Day_____ Night_____ Sunday_____

Mileage charges: Collected_____ Rate_____

Not collected_____

C. Charges for:

Prenatal and delivery care_____ Chest X-ray_____

Opening furuncle_____ WBC_____

D. How are fees collected?_____

E. Percentage of fees collected_____

24. Income

A. Income

Gross_____ Net_____ (From private practice)

B. Investment in plant and equipment_____

C. Income from other forms of practice (specify type)_____

25. List Medical Professional Societies

26. Journals Purchased

A. Professional journals received (note extent to which journals are read)

B. Digests read

27. Postgraduate Study

A. General statement (plan of study)

B. Specify medical society meetings attended in past 12 months

C. Postgraduate courses attended in past 12 months

Subject_____ Duration (days)_____

D. Staff meetings (Hospital, clinic, etc., indicate frequency, subjects, etc.)

28. Hobbies and Recreation

29. Voluntary Civic Organizations

(Civic, fraternal and religious organizations)

30. Civic Offices

31. Detail Men

A. The doctor sees_____

Does not see_____

B. Attitude toward detail men

32. Plans for improvement of practice (Partner, organization, equipment, buildings, etc.)

33. Description of home visits made on one day

34. Public Health*

* This question dealt with certain aspects of public health. Its inclusion was at the behest of a graduate student working for the authors. Its publication is therefore more appropriately left to him.

Appendix III

Individual Morbidity Form

NAME AGE

M F	New Illness_____	Office_____
		Home_____
W C	Old Illness_____	Hospital_____

EXAM:

Eyes_____	Neck_____	Skin_____
Ears_____	Chest_____	Vaginal_____
Nose_____	Heart_____	Rectal_____
Mouth_____	B. P._____	Neurological_____
Throat_____	Abdomen_____	Extremities_____

LAB.:

Hemoglobin_____	X-Ray_____
R. B. C._____	E. K. G._____
W. B. C._____	B. M. R._____
Differential_____	Bl. Sugar_____
Urine_____	Other_____

DIAGNOSIS:

Appendix IV

Medical School Questionnaire

NAME _____ Medical School _____ Year of Graduation _____

PREMEDICAL TRAINING:

College_____Degree_____
Major_____Numerical or letter Average Grade_____
College_____Degree_____
Major_____Numerical or letter Average Grade_____

MEDICAL APTITUDE:

MCAT Score:
Verbal Ability_____
Quantitative_____
Modern Society_____
Science_____
Or Medical Aptitude Test Score (Moss)
Percentile Rank_____

MEDICAL SCHOOL RECORD:

*Class Rank As Student_____Total Number In Class_____

☐ Upper Third
☐ Middle Third
☐ Lower Third

☐ Upper Quarter
☐ Second Quarter
☐ Third Quarter
☐ Bottom Quarter

*** If the above rank is not available, is it possible to rank this doctor on the basis of his medical school record by thirds or quarters in his class:**

Appendix V

Classification of 15,419 patients seen by general practitioners by disease or reason for patient visit*

ISC NO.	*Diagnosis*	*Rate per 1000 Patient Visits*
INFECTIVE AND PARASITIC DISEASES (001-138)**		36.94
A 1	Tuberculosis of respiratory system	5.25
A 5	Tuberculosis, all other forms	.13
A 7	Early syphilis	.26
A 10	All other syphilis	1.43
A 11	Gonococcal infection	2.85
A 12	Typhoid fever	.13
A 15	Brucellosis (undulant fever)	.13
A 16	Dysentery, all forms	.65
A 17	Scarlet fever	1.49
A 18	Streptococcal sore throat	1.36
A 19	Erysipelas	.32
A 20	Septicaemia and Pyaemia	.06
A 21	Diphtheria	.06
A 22	Whooping cough	.45
A 23	Meningococcal infections	.13
A 28	Acute Poliomyelitis	.45
A 32	Measles	3.44
A 34	Infectious hepatitis	3.96
A 36	Typhus and other rickettsial diseases	.06
A 37	Malaria	.26
A 41	Ankylostomiasis	.32
A 42	Other diseases due to helminths	1.49
A 43	All other diseases classified as infective and parasitic	12.26
NEOPLASMS (140-239)		15.29
A 44	Malignant neoplasm of buccal cavity and pharynx	.13
A 46	Malignant neoplasm of stomach	.39
A 47	Malignant neoplasm of intestine, except rectum	.71
A 48	Malignant neoplasm of rectum	.13
A 49	Malignant neoplasm of larynx	.13
A 50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary	.97
A 51	Malignant neoplasm of breast	.78
A 52	Malignant neoplasm of cervix uteri	.84
A 54	Malignant neoplasm of prostate	.58
A 56	Malignant neoplasm of bone and connective tissue	.13
A 57	Malignant neoplasm of all other and unspecified sites	2.33
A 58	Leukaemia and aleukaemia	.45
A 60	Benign neoplasms and neoplasms of unspecified nature	7.72

ISC NO.	*Diagnosis*	*Rate per 1000 Patient Visits*
ALLERGIC, ENDOCRINE SYSTEM, METABOLIC AND NUTRITIONAL DISEASES (240-299)		60.38
A 61	Nontoxic goiter	.52

* This list is based on the I. S. C. "Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality," *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, World Health Organization, Geneva, Switzerland (1949).

** Detailed list numbers

A 62	Thyrotoxicosis with or without goiter	1.49
A 63	Diabetes mellitus	8.24
A 64	Avitaminosis and other deficiency states	3.63
A 65	Anemias	15.63
A 66	Allergic disorders; all other endocrine, metabolic and blood diseases	30.87
	MENTAL, PSYCHONEUROTIC AND PERSONALITY DISORDERS (300-326)	31.91
A 67	Psychoses	.84
A 68	Psychoneuroses and disorders of personality	30.81
A 69	Mental deficiency	.26
	DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS (330-398)	40.78
A 70	Vascular lesions affecting central nervous system	4.67
A 71	Nonmeningococcal meningitis	.45
A 72	Multiple sclerosis	.52
A 74	Inflammatory diseases of eye	3.24
A 75	Cataract	.06
A 76	Glaucoma	.26
A 77	Otitis media and mastoiditis	9.08
A 78	All other diseases of the nervous system and sense organs	22.50
	DISEASES OF THE CIRCULATORY SYSTEM (400-468)	83.08
A 79	Rheumatic fever	2.27
A 80	Chronic rheumatic heart disease	1.75
A 81	Arteriosclerotic and degenerative heart disease	19.59
A 82	Other diseases of heart	5.71
A 83	Hypertension with heart disease	12.97
A 84	Hypertension without mention of heart	27.95
A 85	Diseases of arteries	3.96
A 86	Other diseases of circulatory system	9.08
	DISEASES OF THE RESPIRATORY SYSTEM (470-527)	182.42
A 87	Acute upper respiratory infections	116.54
A 88	Influenza	12.32
A 89	Lobar pneumonia	1.49
A 90	Bronchopneumonia	2.46
A 91	Primary atypical, other and unspecified pneumonia	7.52
A 92	Acute bronchitis	15.82
A 93	Bronchitis, chronic and unqualified	1.04
A 94	Hypertrophy of tonsils and adenoids	5.90
A 95	Empyema and abscess of lung	.13
A 97	All other respiratory diseases	19.20
	DISEASES OF THE DIGESTIVE SYSTEM (530-587)	55.77
A 98	Diseases of teeth and supporting structures	4.99
A 99	Ulcer of stomach	3.05
A100	Ulcer of duodenum	5.19
A101	Gastritis and duodenitis	2.79
A102	Appendicitis	4.54
A103	Intestinal obstruction and hernia	2.98
A104	Gastro-enteritis and colitis, except diarrhea of the newborn	12.32
A105	Cirrhosis of liver	.71
A106	Cholelithiasis and cholecystitis	4.15
A107	Other diseases of digestive system	15.05

DISEASES OF THE GENITO-URINARY SYSTEM (590-637)		**79.07**
A108	Acute nephritis	.91
A109	Chronic, other and unspecified nephritis	1.43
A110	Infections of kidney	7.98
A111	Calculi of urinary system	1.23
A112	Hyperplasia of prostate	2.08
A113	Diseases of breast	1.75
A114	Other diseases of genito-urinary system	63.69
DELIVERIES AND PATIENT VISITS INCIDENT TO NORMAL PRENATAL OR POSTPARTUM CARE, COMPLICATIONS OF PREGNANCY, CHILDBIRTH AND THE PUERPERIUM (640-689, Y00.4, Y06-Y07, Y20-Y29)		**125.81**
A115	Sepsis of pregnancy, childbirth and the puerperium	2.21
A116	Toxaemias of pregnancy and the puerperium	.06
A117	Hemorrhage of pregnancy and childbirth	5.51
A118	Abortion without mention of sepsis or toxaemia	2.66
A119	Abortion with sepsis	.13
A120	Other complications of pregnancy, childbirth and the puerperium	10.57
A120a	Normal delivery	9.79
A120b	Possible pregnancy	1.75
A120c	Prenatal visit, normal pregnancy	72.90
A120d	Postpartum care without complications	20.23
DISEASES OF SKIN, CELLULAR TISSUE, BONES AND ORGANS OF MOVEMENT (690-749)		**71.26**
A121	Infections of skin and subcutaneous tisssue	19.52
A122	Arthritis and spondylitis	14.98
A123	Muscular rheumatism and rheumatism, unspecified	5.64
A124	Osteomyelitis and periostitis	.32
A125	Ankylosis and acquired musculoskeletal deformities	.58
A126	All other diseases of skin and musculoskeletal system	30.22
CONGENITAL MALFORMATIONS AND CERTAIN DISEASES OF EARLY INFANCY (751-776)		**4.21**
A128	Congenital malformations of circulatory system	.52
A129	All other congenital malformations	.97
A131	Postnatal asphyxia and atelectasis	.06
A132	Infections of the newborn	.52
A133	Haemolytic disease of newborn	.13
A134	All other defined diseases of early infancy	1.43
A135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	.58
SENILITY, ILL-DEFINED DISEASES, SYMPTOMS (780-795)		**44.42**
A136	Senility without mention of psychosis	2.33
A137	Ill-defined and unknown causes of morbidity	42.09
ACCIDENTS, POISONINGS AND VIOLENCE (N800-N999)		**87.88**
A138	Fracture of skull	.45
A139	Fracture of spine and trunk	2.33
A140	Fracture of limbs	10.05
A141	Dislocation without fracture	.39
A142	Sprains and strains of joints and adjacent muscle	12.65
A143	Head injury (excluding fracture)	3.63
A144	Internal injury of chest, abdomen and pelvis	.13
A145	Lacerations and open wounds	26.79
A146	Superficial injury, contusion and crushing with intact skin surface	12.78

A147	Effects of foreign body entering through orifice	3.37
A148	Burns	5.84
A149	Effects of poisons	2.27
A150	All other and unspecified effects of external causes	7.20
REASON FOR PATIENT VISITS OTHER THAN ILLNESS (Y00-Y05, Y08 & Others)		66.28
A151	Check-up (normal)	5.12
A152	Prophylactic inoculations (age 6+)	5.45
A153	Follow-up exam, post-operation, injury or disease	2.66
A154	Carrier or suspect carrier	.26
A155	Healthy person accompanying or inquiring about sick person	2.98
A156	Well baby and child care (0-5 years)	27.76
A157	Contraceptive guidance	.45
A158	Examination for administrative purposes	18.68
A159	Anesthesia for dental purposes	.26
A160	Prophylactic medication administration	.06
A161	Diagnosis, normal or no disease	2.60
DIAGNOSIS UNKNOWN OR DEFERRED		14.40
A162	Diagnosis unknown, questionable or deferred	14.40